Railway Age Gazette

Including the Railroad Gazette and The Railway Age

PUBLISHED EVERY FRIDAY, AND DAILY EIGHT TIMES IN JUNE, BY
THE RAILROAD GAZETTE (INC.), 83 FULTON ST., NEW YORK.

CHICAGO: Plymouth Bldg. CLEVELAND: Williamson Bldg.
LONDON: Queen Anne's Chambers, Westminster.

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Subscriptions, including regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico	$5.00 a year.
Canada	$6.00 a year.
Foreign Edition (London)	£1 12*s.* ($8.00) a year.
Single Copies	15 cents each.

Shop Edition and the eight M. M. and M. C. B. Convention Daily issues, United States and Mexico, $1.50; Canada, $2.00; Foreign, $3.00.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

VOLUME 49. FRIDAY, SEPTEMBER 9, 1910. NUMBER 11.

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THE Union Station in Washington, the new Pennsylvania Terminal in New York, and the new Northwestern Station in Chicago are splendid examples of the tribute railways feel they must pay to large cities. For some years the architecture of stations and the attention given to station grounds in suburban residence towns have been improving. But the towns and smaller cities remote from centers of population have usually had to get along with station buildings of low cost and mean appearance. As people usually appreciate whatever a railway does to improve the looks of their town, it is good policy to regard architectural appearance as well as durability when erecting new stations. The present policy seems to be to erect more substantial buildings; but saving repairs and doing away with the necessity of painting and high insurance rates should not alone be considered. Many solid and substantial appearing brick and stone stations are so homely that the local citizen is apt to wish they were not so fireproof. The town of Grand Prairie, Tex., has barely 300 inhabitants, yet the Texas & Pacific has seen fit to spend there over $6,000 in the erection of a handsome station of reinforced concrete, with concrete floors and metal roof, which is described elsewhere in this issue. This gives the people a kind of civic center, and is apt to cause them to have a friendlier feeling toward the road. It is good business for the railway in that it will be saved maintenance expenses, and the need for replacement will not come so soon as if the building were of more temporary construction.

THE only possible criticism that can be made of President Taft's appointments of members of the commission to investigate the question of public control of the issuance of railway securities is that he did not give at least one of them to a practical railway man. The selection of President A. T. Hadley of Yale as chairman of the commission is peculiarly happy, for Dr. Hadley has been recognized for many years as the leading authority on railway economics in this country. Professor H. B. Meyer, one of the members of the commission, is another distinguished authority on railway economics and has acquired great practical knowledge of railway regulation as a member and chairman of the railway commission of Wisconsin, which is one of the ablest of the state commissions. F. N. Judson, of St. Louis, another member, is the author of an authoritative book on the law of interstate commerce. Walter L. Fisher is one of the ablest lawyers and most public-spirited citizens of Chicago. Frederick Strauss will contribute to the strength of the commission both by his knowledge of economics and his practical experience as a banker. Some of the men on the commission have been strong advocates of the extension of government regulation of industry. Others have expressed rather conservative views upon the subject. Regardless of their present or past views no one familiar with their careers can have any doubt that they will approach the investigation and the consideration of their subject without any interested bias and that their report will be a fair and able document.

OFFICERS of the Trunk Lines have decided that from January 1 all divisions of through freight rates with short terminal and industrial railways shall be abolished. This is in accordance with the decisions of the Interstate Commerce Commission in the cases of the Star Grain & Lumber Co. and the Crane Iron Works, where such allowances were held to be virtually the same as rebates to the shipper, the shippers being the owners of the short railways. It was voted some time ago to make this change August 1, but postponement was decided on because of the strong protests from the short lines. Some of the gossips seem to be worried over the possible dire results of this change in the method of making rates on freight forwarded by shippers who have short railways of their own. It is declared that, in some cases, these short railways cannot be operated except at a loss. Again, it is said that the only way out will be for the strong railways to buy the industrial lines outright. But why not simply adopt, as the published rate from the junction to destination, the same amount that the railway has all along been receiving for that part of the service? It is as simple as A, B, C. Possibly there might be a slight collision with the long and short haul law in some cases; but if that law has been defied by these excessive allowances for 20 years—as has been the case, undoubtedly, in some instances—why should not the defiance be continued? Possession of a privilege for 20 years has often been treated by the courts as presumptive evidence of rightful possession. Seriously, however, the fact remains, after all the discussion about technicalities, that the "top line" deserves compensation for all the useful work that it does and that the money for

this compensation ought to come out of the "ultimate consumer" of the lumber or other merchandise. If the short line has been allowed only a fair sum, the shipper must henceforth allow the same sum and add it to the price which he charges for the lumber "free on board" the actual railway. If this results in raising his price so that some competitor gets the business away from him, who is to blame? Not the Interstate Commerce Law, surely; nor can it be the railway that has been accepting too small a percentage its own service.

THE description in this issue of the use of concrete to preserve the metal in an old trestle and at the same time so to increase the strength of the structure as practically to make it new will interest engineers. One of the subjects given great attention at the International Railway Congress this year was that of strengthening old bridges, for the continually increasing train loads are a matter of concern to men charged with the maintenance of structures. The work done on the Wabash in converting old wrought iron trestles into trestles of reinforced concrete is said to have cost fully $40,000 less than would have new steel trestles designed for present day loads with proper allowance for increases during the lifetime of the structure. It is believed that the reinforced trestle will be fully equal to the work of carrying the traffic for many years to come. The laboratory tests on a specimen column showed the strength to have been doubled by the addition of the wire-wound concrete envelope, but this, of course, does not prove that the strength of the trestle has been doubled. In the connections of a tower bent many indeterminate stresses are produced, so that it is practically impossible to say what is the real strength of a trestle designed strictly as a reinforced concrete structure. In the case of the Danville, Ill., and the St. Charles, Mo., trestles, we have metal structures designed as such and with all connections made precisely as though protecting concrete had not been thought of, as, of course, it had not been at the time the trestles were erected. The strength of the verticals has been practically doubled by their envelopment in wire-wound concrete, but the exact effect upon the struts and braces remains to be seen. In the meantime the stiffness of the structure is wonderfully increased. The work was done without interrupting traffic and the effect that would be produced on the concrete while it was setting, by the passage of long and heavy trains, caused some concern. An examination of the finished work shows that the surface is very smooth and the work is first class. While the work was in progress news was received of the organization in England of the Improved Construction Company, licensed under the Jagger patents to make concrete products on a vibratory table. The invetor, Mr. Jagger —a name singularly fitting for such a process!—claims that when freshly made concrete is placed upon a platform to which is imparted "a horizontal vibratory motion combined with a suddenly arrested rocking movement," the material rapidly solidifies and squeezes out all excess moisture and air, together with all deleterious, partially dissolved substances which generally rise to the surface of setting concrete and are known by the generic term "laitance." The description of the motion of the platform in the Jagger process is similar to the motion imparted to a high trestle by a train passing over it. If the Jagger process is really efficient in producing dense concrete of good quality, there need be no fears of the quality of the concrete used in strengthening old iron or steel trestles. A similar process has been used in the United States for casting concrete fence posts. The Phoenix column is not ideal reinforcement for reinforced concrete columns, so that a wire helix is necessary, but latticed colums should be excellent. The experiment on the Wabash having proven successful it is not too much to expect that in the future other trestles, at present carefully watched, may be converted into structures of reinforced concrete. This will mean a new lease of life and a discontinuance of maintenance charges, for concrete does not deteriorate with exposure to the elements, does not burn and never needs paint. How well it will stand up under long continued vibratory stresses remains to be seen.

NEW EMPLOYERS' LIABILITY LAWS.

THE employers' liability laws of the state of New York, as recently amended, put on steam railways a new and heavy burden—if the amendments stand the test of constitutionality. Building contractors and many other classes of employers, especially those not possessing large capital and doing business on the most extensive scale, are hit much more severely than the railways, so we may expect very prompt action to test the new laws in the courts.

We give an abstract of the laws in another column, omitting, however, the optional compensation feature which seems little likely to find favor with any employer. (This feature, not applicable to railways, provides that an employer, by making a contract with an employee—a thousand contracts if you have a thousand men—may arrange to pay him half pay while injured, for not exceeding eight years, or give his widow approximately three years' pay, if the employee is killed; and thereupon be exempt from the ordinary liability for damages.) The legislature has modified the fellow-servant rule by making all bosses the same as vice-principals; has changed the rule concerning assumption of risk by an employee, so that continuing at his work after a risk is known, does not throw this burden on him, if the employer could have known of the danger by reasonable care; has placed on the employer the burden of proof of contributory negligence; has amplified the list of negligent defects for which the employer is liable; and for certain dangerous occupations has made compensation compulsory, regardless of liability or blame. If, for example, a brakeman falls off a car and is killed, or a track laborer is knocked down and killed by a locomotive, 1,200 days' pay is due the widow "and no questions asked."

This last provision (concerning dangerous occupations) is the most radical of the lot. The intent of this provision is as we have stated it; but (assuming that the amendments are not wholly nullified at once by conflict with the constitution) there will be litigation on innumerable points. For example, is a trackman who carelessly steps in front of a locomotive taking a risk which is necessary or inherent in his work? Does a telegraph operator who causes a collision have "control" over a brakeman killed in the smashup? The employer may not be liable for compensation for an accident if the workman is chargeable with serious and wilful misconduct. Stepping in front of an engine or falling asleep on the edge of the roof of a freight car may not be wilful misconduct, though it certainly is serious misconduct; but that little word "and" exempts that careless employee. The definitions of dangerous occupations are full of opportunities for legal disputes, especially as to whether an injured employee had been working on, or only near, the dangerous work specified.

Many corporations now take out insurance policies to cover all their liabilities on account of accidents. Under the new law these may be worse off than those which stand their losses directly, for the insurance companies will have to raise their rates by percentages based on guesswork, and they will naturally give themselves the benefit of all doubts. The insurance men estimate that the accident burden will be increased by these laws as much as 75 or 100 per cent.

The constitutional questions are obvious, and many lawyers feel sure that they will prove fatal to the acts. Why give the right of compensation to a man who falls off a steel bridge but not to one suffering the same accident at a wooden bridge? Where is the justice in imposing on a builder of a $10,000 dwelling using 20-ft. scaffolds, the same liability as that imposed on big contractors engaged in putting up skyscrapers, whose semi-monopoly gives them a chance to recoup these losses? How can liability be equitably imposed on the New York Central, on its electric lines, because it is a "steam" road, while the Interborough's parallel line is exempt because it is not "steam"?

That the new laws were made wholly in the interest of employees, with only perfunctory or forced consideration of employers' interests, is obvious on the face of the statutes. The employee has the choice of two remedies when he has been injured

at his work: he may claim a moderate sum as "compensation," regardless of who is to blame, or he may sue in the courts for a larger sum, if he thinks a larger sum can be got by charging negligence against the employer. The employer, on the contrary, has no choice. Of course, no such wholly one-sided proposition would have passed so easily had it not found favor in high places. This whole movement only carries out the proposition, voiced by Mr. Roosevelt, President Taft and others, that as regards repairs and maintenance a man in a shop should be put on the same basis as a machine in the same shop. On the surface this looks extremely simple, but before the principle is embodied in American laws generally there will be an enormous amount of litigation which will be far from simple. One unfortunate feature, from the employers' viewpoint, is that when a manufacturer has found a perfect machine he may buy any number of duplicates of it; whereas, the possession of a perfect artisan often affords little or no aid in securing other perfect men. It is necessary to wait till they grow up; and the growth of good men is often hindered by the labor unions.

THE CENSUS AND THE RAILWAYS.

THE conspicuous fact disclosed by the final returns of the census of 1910 is the great growth of the population of the cities as compared with the country as an entirety, and yet more as contrasted with rural populations outside of the far western states. It is a subject that has much food for reflection in a number of directions—sociological, political and economic. It is in this last category, however, that it bears on the railways, and in several suggestive and interesting forms. Mutations of working populations mean also industrial perturbations affecting the volume both of consumption and production, which, in time, affect radically railway freight traffic. More directly also do the variations of population reflect the passenger business, saying nothing of express and mails, the former of considerable importance in railway returns.

Speaking in general terms, a city—and the same is true of the factory town—is the consumer of low class freight large in volume. It takes coal, cotton, wool, breadstuffs, lumber, ore, and metals in their secondary stage from the ore. It sends out the higher classes of freight in the form of finished products in wood, metals and the textiles, but in diminished volume as compared with consumption, securing, of course, a higher freight rate. For purposes of illustration, just here, one may almost take that small corner of the country represented by New England and consider it, with its extensive urban and factory populations, as one great city. Apart from its quarries and the great potato crop of northern Maine, it takes practically nothing for railway business out of the ground. It consumes a vast amount of raw material, much of which reaches it by rail. But at least two-thirds and probably more of the cars that take in the raw material return empty, the rest being loaded with profitable high class freight. Theoretically the growth of eastern cities during the last decade, which may be roughly estimated at nearly or quite one-third, means the preservation of the old ratios of ingoing and outgoing freight business and the absolute increase of both—a good thing for the railways. Practically there may be seen two forces disturbing the ratios—one the ocean export business; the other the competitive growth of factory business, with its high class freight at the inland cities west and south. Atlanta, Birmingham, Chicago, St. Louis, Cincinnati and Detroit, with long railway radiations toward all points of the compass, get, as compared with the eastern city, new significance in this era of urban growth, especially in their relation to home and local markets.

That the eastern cities under such railway traffic conditions have so well held their own in expansion of population is somewhat remarkable. It is, perhaps, explained in part by their interception of the flood of foreign immigration, which still seems to hold to the city rather than the country. But, whatever the cause, it remains true that the swift growth of far inland cities and their progress in manufacturing already affects railway rates. The eastern manufacturer demands as low a rate as possible both on ingoing and outgoing freight, not merely as a phase of human nature, but as a factor in holding the inland market for factory goods west and south. In connection with the growth of cities both eastern and inland this is a branch of the subject into which we may yet see the question of tariff duties on raw material enter as an intensified political influence.

Simpler in its elements is the bearing of the rapid growth of American cities on railway passenger business. Theoretically urban population should rise upward in something like even ratios with the increase of passenger traffic, though varying, of course, with localities. During the last census decade it would probably have done so but for certain extraneous disturbances. On the one hand there have been during the ten years, in response to the public demand, somewhat exceptional enlargement of train service and station facilities, especially at large terminals. On the minus side have been the expansion of the competitive electric lines, the use of long-distance telephone and the incoming of the automobile. All three are more potential in the case of city populations than in those of the country regions, though they exist in both. But, of the three, the rival street railway and the long-distance telephone have already largely spent their competitive power. The automobile has not done so yet. But any estimate of its effect on passenger business of the railways must be reckoned in what may be called "short distance" values as a feeder. Like the electric lines, it may be a long-distance rival, but at the same time a lateral that brings the steam railway station miles away within the old walking distance measured in time. On this point, as related to variations of populations, we shall know more with the census of ten years hence.

Ere long the full returns for all the municipalities of the land of more than 10,000 inhabitants will be at hand, and later we shall know not only what the passenger business of the railway is as compared with ten years ago, but also, in a rough way, the character of the railway business in terms of raw and finished material and of rural and city products. In both quarters the comparisons and contrasts promise to be instructive.

IMPROVING SERVICE BY INVESTMENTS FROM EARNINGS.

SEVERAL of the witnesses who testified for the railways in the rate advance hearings at Chicago last week, and especially Mr. Ripley, put much stress on the need for an increase in railway earnings to enable the roads to give the public the better transportation service that it demands. This demand of the public for better service is perfectly justifiable. When any man says that the rates of American railways are, or ever were, excessive, he talks nonsense. But those who criticize the service of American railways have a case. The service of most of our roads is inferior to what it ought to be. It ought to be more convenient. It ought to be more adequate. It ought to be safer. In order to make it safer, much track ought to be straightened and strengthened; much second track ought to be built; thousands of miles of block signals ought to be installed, and thousands of grade crossings ought to be eliminated. In order to make it more convenient, hundreds of stations ought to be replaced with better and larger ones, and the operation of both freight and passenger trains should be made speedier and more dependable. In order to make it more adequate, more miles of line, more trackage of all kinds and more equipment ought to be provided. As Mr. Ripley said, while railway men do not like to depreciate their own property, they recognize that "the best railways in this country west of the Allegheny mountains are very, very far short of what they ought to be to give the service that the public requires and has the right to demand, or would have the right to demand if it paid for it." As all kinds of traffic can move freely on existing rates, and

could on substantially higher rates, the question of service is a great deal more important in this country than the question of rates.

It will be conceded on all hands that the facilities of the railways should be improved and increased. But those who agree most harmoniously on this point are apt to disagree most widely on how the necessary expenses for doing this should be met. Mr. Ripley stated his views very clearly. Improvements may be roughly divided into two classes—those which increase the earning capacity of a road in proportion to their cost, and those which do not. To the latter class belong the handsome and expensive passenger stations which every city is demanding. For example, the new union passenger station at Kansas City will cost $2,000,000 or $3,000,000. A station which would serve adequately all purely transportation purposes could be built, Mr. Ripley estimated, for $200,000. All of the rest of the expenditure is a tribute paid by the road to the public-spirited ambition of the people to beautify their city, and will not increase the earning capacity of the railways a dollar. The elevation of tracks in cities is very desirable, because it promotes public safety. It also to some extent serves the convenience and reduces the expenses of the railways. But the amount it costs greatly exceeds the purely economic benefits derived from it. Mr. Ripley contended that improvements which do not increase the earning capacity of the railways should be paid for mainly or wholly from earnings. If a railway is paying 6 per cent. dividends it should be allowed to earn 12 per cent. on its stock, the extra 6 per cent. to be applied on improvements which will benefit the public but will not increase the road's earning capacity.

It is evident that improvements have got to be paid for whether they increase the earning capacity of a railway or not. Improvements which do increase earning capacity may be and ought to be capitalized, because the increase in earning capacity which they cause will afford the means of paying interest and dividends on the increased capitalization. On the other hand, the improvements which do not increase earning capacity ought to be paid for out of earnings, because really, in the long run, the expenditures on them are simply a part of the expenses which it is necessary to incur to make and keep the property on a basis where it can serve the public and earn an adequate return for its stockholders. If improvements of the kind in question cannot be paid for out of earnings, they either cannot be made or they must be paid for from the receipts of increased capitalization. If they are paid for from the receipts of increased capitalization the burden imposed upon the public, in the long run, will be greater than if they are paid for from current earnings. Take, for instance, the case of a station which costs $2,000,000, and which, at the rate at which this country grows, may be obsolete in 25 years. Interest at 5 per cent. would in 20 years equal the total expenditures on it, and at the end of the time the bonds which were issued to raise money to pay for it would still be outstanding. The construction at the end of the time of another station which might cost $6,000,000 or $8,000,000 would involve an additional increase in capitalization, on which additional interest and dividends would have to be paid. The result of such financiering would be to increase the capitalization of American railways, as it already has increased the capitalization of the railways of England, to a point where it would be practically impossible to earn a return on it.

The explicit adoption by the regulating authorities of the policy of letting each railway earn enough in addition to reasonable interest and dividends to pay out of earnings for all improvements which do not increase earning capacity would not only prevent an excessive increase in capitalization, but would also add to the value and stability of the securities, both bonds and stocks, which were issued. It may be said that there is no certainty that after the roads had spent earnings on the property they would not capitalize them. But past experience has shown that badly managed roads are as apt to distribute stock dividends which represent no investment in the properties as they are to capitalize earnings which have been put in the properties, and that, on the other hand, well managed railways are apt not only not to capitalize improvements which have no earning capacity, but are apt also not to capitalize some improvements which have earning capacity. The amount of earnings invested in the properties without being capitalized has been in the past much larger than the amount that has been capitalized. And with public sentiment as it now is in this country, the extent to which watering of stock—or anything that might invite condemnation as such—will be carried in future seems very apt to be pretty small.

NEW BOOKS.

Coal Mines. By B. R. Rose, Rockefeller Building, Cleveland, Ohio. 278 pages; 6 in. x 9 in.; leather. Price, $5.00.

This publication is intended for the use of coal consumers, to enable them to locate readily any particular coal from the bituminous and semi-bituminous mines in states east of the Mississippi river. The main classification is by states, at the head of which is a list giving the different coals and the counties in which they are mined. The counties of each state are arranged alphabetically, with the coal companies, names of mines, veins, thicknesses, daily capacities and railway connections given in each case.

The Settlement of Labor Disputes.

This is the sub-title of the September number of the *Annals of the American Academy of Political and Social Science* (Philadelphia). In this number of the magazine 200 pages are filled with 19 articles on the subject named. These are given under four heads: Special Problems; Methods of Settlement; The Law of Labor Disputes in the United States; The Law of Labor Disputes Abroad (Canada, New Zealand and Germany). The authors who figure in this series are: Samuel Gompers, Walter Gordon Merritt, Margaret A. Schaffner, J. Wallace Bryan, Cornelius J. Doyle, Joseph Krauskopt, D.D., Ethelbert Stewart, T. L. Lewis, Frank Julian Warne, Ralph Kendall Forsyth, T. D. Nicholls, James W. Van Cleave, Truman S. Vance, C. O. Pratt, John Lundrigan, Robert Luce, F. A. Acland, Paul Kennaday and Harris Weinstock.

Letters to the Editor.

ACCIDENT RECORD—CORRECTION.

New York, Chicago & St. Louis Railroad Co.,
Cleveland, Ohio, Aug. 29, 1910.

To the Editor of the Railway Age Gazette:

I note in your issue of August 19, page 313, report of train accidents, that you show a collision on this line July 20 at Chicago, in which one person was killed and one injured. This report is incorrect. We have no knowledge of any such accident at this office.

A. W. JOHNSON,
General Manager.

JUNCTION CARDS AT INTERCHANGE POINTS.

Pueblo, Colo., Sept. 3, 1910.

To the Editor of the Railway Age Gazette:

One of the changes taking place in the railway world is the consolidation of mechanical and transportation car records at points of interchange. It has its opponents, but it is being tried at a few places, and improved service has resulted. Some of the good things secured are a reduction in expense; the ending of duplication of work, prompt interchange reports, a distinct time of delivery, a consistent check of car numbers and initials, the furnishing of the same data to the delivering and receiving

lines, a reduction of from 75 to 90 per cent. in the volume of tracers, and a more general feeling of harmony between the two departments because of the dual responsibility. And there are still other benefits. No resultant delay has been encountered so far as mechanical inspection has been concerned, nor has the physical record of the car been impaired. The co-operative plan has commendable features in such great number that it may well be considered as one of the advisable, progressive measures of the day.

During the recent annual convention of the Car Accounting and Transportation Officers, at Colorado Springs, Colo., J. R. Kearney, superintendent of car service of the Baltimore & Ohio, following the report of the Committee on Joint Inspection and Interchange, suggested the practicability of the issuance of junction cards from the central office at cities where such offices have been installed and are in working order.

Experience here at Pueblo with the consolidated bureau suggests that Mr. Kearney's idea is entirely practical. That there could be a valid objection to this plan at points equipped with a well organized interchange bureau seems impossible, because the interchange data furnished by that central office are the authority upon which the car accountant now issues the junction card. Suppose the Rock Island delivers a Southern Pacific car to the Santa Fe at Pueblo for western movement. The Southern Pacific people are compelled to wait until our interchange sheet journeys to Chicago, where the junction card is issued by the Rock Island car accountant; then the card has to travel back through Colorado on its way to San Francisco. Had this junction card been issued concurrently with the interchange report, as suggested, the car owners in San Francisco would know of its whereabouts practically as soon as the Rock Island car accountant in Chicago. Under the present system a week at the very least would elapse before the owner could possibly receive this information. Had this particular car been loaded with a commodity that required a fairly good forwarding movement, it could have been at any one of two or three Southern Pacific connecting points before its owner had been advised that the car had left Rock Island rails. Thus the whereabouts of a car at the very door of its owner is not available to him because of the present system of issuing junction cards.

Another good feature of the suggested plan would be its tendency to decrease car balances. I have in mind an owner, "X," charging a connection with 95 of his cars when the connecting line's tally showed 32 of X's cars in its possession. What superintendent of car service can locate his cars from such statistics? Of course we will admit that there will always be more or less of a discrepancy in car balances on account of mileage from interchange points, and possibly from lack of a uniform time for tallying, but the suggested plan will at least reduce the discrepancies.

It is understood that some have objected to the plan because of possible errors in car numbers and initials, claiming the car accounting officers fortify against these errors by comparison with the car's previous movement on its line. The fear is also expressed that there would be an increased expense for post cards. Grant that where the interchange report is so unreliable as to need verification in the car accounting office before the junction card may be safely issued, it would clearly be unwise to omit that precautionary measure. But why not have reports that are correct? Are they not cheaper in the end? By specializing in this branch of work, the bureau can and does verify the interchange data while the eye is still fastened on the car rather than leaving it for the over-burdened car accounting office to do after the car is a thousand miles away. Since, therefore, the bureau's interchange report when rendered has been verified and is correct, in what way can it be unsafe to use that data in promptly notifying the car owner (whether a private line or a railway) to what railway his car has been delivered? And by no means is it a settled fact that the expense for postage would be increased—assuming the point is vital when measured against the time that would be saved.

One thing is certain: the junction card could leave the bureau office as soon as the interchange took place and journey, theoretically, on a tangent to the car owner. And why not let the advice to the owner go from Pueblo to San Francisco direct and cut out the 2,000-mile trip from Pueblo to Chicago and return?

At any rate let us try the idea in a small way, and then decide whether to abandon or extend it, as its merits deserve.

L. D. ROBERTS,
Manager Pueblo Joint Car Inspection and Interchange Bureau.

THE STATION AGENT'S UNPLEASANT WORK.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In your issue of August 26 you have something to say of station cleanliness. It appears to me that neither the Baltimore & Ohio nor Mr. Paine has discovered the true reason for the difficulty in keeping stations clean; nor have you. The station agent is the representative of a large corporation. He must know something of the working of each department and its relations to the organization as a whole, and to the public. He must be a man of somewhat general education and capable of transacting the business of the company on an equal plane with other business men of the community. A man who can successfully do these things dislikes in the extreme to make himself a janitor and scavenger for all the town bums and drunks who loaf around his depot. He may have the "energy" suggested by Mr. Paine, but if he has any personal pride or dignity he will dislike being called from a back room, when covered with dust and dirt and ill-smelling water, to figure out a summer trip for Mrs. Home Banker, a very particular old lady.

The only way to maintain clean stations is to clean them regularly. An old box car, two or three men, a tub of water, a few brooms, disinfectants, and such appliances, carried on local trains from station to station would work wonders by the expenditure of a few hours at each station, and would cover quite a territory in sixty days. That would be about three times as often as most stations are cleaned under the present system of circulars from the superintendent's office. This same gang could also make minor station repairs, such as putting in broken window glass, repairing locks, and replacing loose boards in the platform. The expense of maintaining such a crew would be many times repaid by the good will of the agent and the community.

AGENT.

IDENTIFICATION OF TRAINS.

Chicago, August 27, 1910.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The subject of train identification is one which materially affects safe operation and is worthy of discussion. Most methods now in use employ the engines' numbers or conductors' names, or train or engine numbers displayed on the cupola of the caboose. These leave much to be desired. It is rather curious that with all the attention that has been given to the standardization of train rules and other items of operation, the roads in general still depend largely on chance and guesswork in this important matter. While many roads have adopted some sort of device, the majority depend on the crude methods of identification in use 50 years ago.

The Train Despatchers' Association has given this subject some consideration, and in its 1909 convention adopted the report of the Committee on Train Rules on the desirability of some method for providing positive identification. It does not appear, however, that this action has produced any result, possibly because of the fact that the Train Despatchers' Association is not regularly affiliated with any of the "legislating" organizations of officers.

While there has always been need of some better system, the

necessity seems to increase with the specialization of service, and higher speeds in both passenger and freight service. It is true that with the advent of double track there has been a reduction in meeting points, but this has been more than offset by the abandonment of schedules and the substitution of extras in double-track operation. And under the extra system, simple train numbers have given place to lengthy designations such as "Extra West 7669," rendering identification more difficult and increasing the liability of error.

The necessity for more distinctness in indicators is being recognized in many ways, and a great deal of thought and money has been expended on the improvement of headlight numbers, signal lamps, semaphore arms and the like.

I remember when, as a telegraph operator at an interlocking tower, I was reprimanded for running a "fast freight" in behind a couple of slow drags, due to an error in identification. My excuse was that I "supposed" the fast freight to be behind a train of coal; but the coal train had slipped in on a blind siding to let the fast train by. The fast train got stuck for a passenger, and the delay was 40 minutes. I was told that "supposing is not railroading"; but I knew from experience that if my supposition had proved correct, it would have been merely "good judgment."

It is told of a "student" of railroading who observed an odd numbered engine going east, while his time card said eastward trains bore even numbers, that he propounded the query, "Why don't they run their even engines East, and their odd engines West?" This led to the suggestion by a more practical man that the engine numbers be disregarded so far as train movements are concerned.

As a basis from which to work out a uniform system of identification, I would suggest the following plan:

Affix to the front of the engine an identification device equipped with lights and supplied with changeable number and letter stencils that would provide a clearly visible identification signal either in daylight or at night. This could also be used as a classification signal, and as a "schedule fulfilled" signal, which is also something that is badly needed. As an additional check this device could be duplicated on the cupola of the caboose.

The train numbers, whether scheduled or extra, should be as short as possible, to avoid confusion in identifying rapidly moving trains.

Extra trains, instead of bearing the engine numbers, should be assigned by the despatcher from a series that would not conflict with scheduled numbers, the odd and even extras to conform to their direction. Work extras that might run in either direction on one order could be given alphabetical designations such as "Extra A," etc.

This is certainly a matter of sufficient importance to engage the attention of the Committee on Train Rules of the A. R. A. The theory on which such serious thought has been expended on the Standard Code of Train Rules is that where there is room for doubt there is danger; and if there is any point in everyday operation in which there is a larger element of doubt than in the question of train identification, it has escaped my notice in some 17 years of railway service.

TRANSPORTATION.

[There appears to be a decided difference of opinion among railway officers as to whether train indicators are necessary; but there ought to be no difference as to the desirability of making the indicators, if they are used, large and easily readable under the most unfavorable conditions, day or night. As a measure of safety, indicators should be more and more useless, year by year, for with the extension of the block system the engine at the front end and the markers at the rear become the only "indicators" necessary. The class of a train is immaterial. As a matter of convenience, however, for station men, trackmen and men in charge of other trains the most complete identification is desirable. What degree of care and expense is justifiable to accomplish this?—Editor.]

TRANSPORTATION AND TRAFFIC IN ITALY.*

BY LOGAN G. M'PHERSON.

The area of all Italy is 114,409 sq. miles, about 6,000 sq. miles less than that of Great Britain and Ireland. The northern part, bordering Switzerland and Austria, has attained a considerable development in manufacture. The central reach of the peninsula is divided longitudinally by the Appennine Mountains. On either slope of the range are farms. Agriculture and the raising of fruit are prosecuted to the south in the plains of Calabria and on the Island of Sicily.

In northern Italy are lakes Maggiore, Como, Luegano and Garda, which are navigable, but the traffic is principally of passengers, the freight boats carrying only from 5 to 40 tons each.

The rivers of Italy are little used for navigation except the Po and the Adige and the few other streams in the plain between the Appennines and the Alps, all of which flow into the Adriatic. The Po is navigable for 368 miles, a much larger reach than is available on any of the other rivers. The Arno and the Tiber, flowing into the Mediterranean, are used but for short distances, as are also a few other unimportant streams in Tuscany and the Campania, farther south.

In the construction of artificial waterways Italy was in advance of the other countries of Europe, canals having been built in the eleventh and twelfth centuries, mainly to connect the rivers and lakes of northern Italy. At about the same time Venice was improving her rivers and building canals, as were Bologna, Ferrara, Padua and Modena. A network of waterways was thus formed throughout northeastern Italy, which was used not only for navigation but for drainage, irrigation, protection from inundation and production of power. Two smaller canals were built tributary to the Arno and the Tiber, but they have never been of a great deal of use. The existing canals are substantially the medieval network. As their depth rarely exceeds six feet and the water is mainly used for other purposes, they are in but small measure available for navigation. The traffic has been decreased in the last fifty years, being estimated at present as about 5,000,000 tons. The navigation is principally by boats drawn by animal power, although in recent years a few boats have been placed in use that are propelled by steam or gasoline engines. The waterways leading from the higher ground were once largely used for the floating of lumber, but in the last thirty years this has greatly diminished, the traffic going principally by the railways.

The total length of the navigable waterways of Italy is about 2,000 miles, of which the rivers and canals of northern Italy connected with the Po constitute nearly 1,500 miles, and the navigable canals about one-third of the entire length. The control of the waterways is under the ministry of public works, exercised through the director general of waterways. The state bears the expense of maintenance of the waterways that are of general navigable use, and also aids the provinces in the maintenance of purely local waterways, which is also shared by various associations of those particularly benefited.

No tolls are charged for the use of lakes and rivers; tolls are charged under special laws for the use of certain canals. At the time of the introduction of railways attention was directed toward the development of these enterprises, the waterways for a time almost disappearing from the budget. Capital expenditures have never been resumed to any great extent, but the expenditure borne by the government for maintenance averaged about $230,000 per year from 1874 to 1901.

At the time of the introduction of railways Italy was occupied by a number of separate states. The first railway in the peninsula was built under concession of the Neapolitan government in 1836. It extended for but 32 miles from Naples to two towns in the vicinity, and was not completed until 1860. In 1837 concession was granted for a line between Milan and Como, which was completed in 1849. These lines answered the purpose of pleasure travel rather than any commercial need. In 1842 the

*A preliminary report to the National Waterways Commission.

kingdom of Naples entered upon the construction at state expense of a line extending for about thirty miles to Caserta, where was the king's palace; and to Capua, the site of an important fortress. Another road undertaken by the state was completed for about 20 miles.

Railways really intended to answer the needs of commerce were first begun in Tuscany and Lombardy, under the auspices of the Austrian government, then the sovereign of these provinces. The first line was that covering the 189 miles from Milan to Venice, completed in 1857. It was begun under a concession, but taken over and completed by the government, which desired its construction for military ends. Austria also built directly another line or two in its Italian provinces and then brought about an agreement between the different states for the concession to a private corporation for a line through central Italy. The concession was for 100 years, the company was granted exemption from taxes and duties, as well as a guarantee of 3 per cent. interest on the capital, the amount of which was not stipulated. Because of the unsettled conditions due to the Crimean war, the company was unable to obtain capital and in other respects demonstrated its incompetency. The governments concerned conceded the lines to another company, which by the time of the war of Victor Emmanuel and France with Austria had made much progress. Parma and Tuscany had also made concessions for lines to private companies, which in many cases were unable to carry out their contracts, becoming bankrupt and applying to the states, which made further concessions. Piedmonte granted a concession to a private company for the building of a line between Turin and Genoa, which was opened in 1854. To other lines the state of Piedmonte extended pecuniary assistance, in some cases by way of capital subscription, in others by guarantee of interest and in other cases by taking over the lines and agreeing to operate them for 50 per cent. of the revenue. The state of Rome also made concessions to private companies which were delinquent, often engaging in speculation instead of construction. This in one case led to the disappearance of the cash, which was followed by the chief culprit being sent to jail. The company was saved from bankruptcy by the government, which desired railway communication with two neighboring provinces which it had just annexed.

The Italian kingdom thus found its railways in various tangles. At the meeting of the first Italian Parliament, in 1860, there were in operation in the whole of Italy 1,308 miles of railway and another 1,245 miles were in course of construction or under concession. The lines were mostly in small and incomplete systems that were not connected one with another. The new government, therefore, to unify the railways, found it necessary not only to continue the existing projects, but to connect the different systems. Because of the different conditions under which they had to be constructed and of the different companies and concessionaires that still had rights to be respected, this was of exceeding difficulty.

Guarantees made by the Austrian government to the lines in Lombardy were continued and further privileges accorded which permitted the extension of the lines. Further concessions were made to other private companies. Within two years from the installation of the new government 257 miles of new lines had been constructed. In its anxiety to assure the people that it intended to provide for their needs, the government made many unfavorable concessions, some of which it was later obliged to take over and complete. For example, English capitalists who had obtained a concession for lines in the province of Genoa were unable to carry out the contract and forfeited 500,000 franks ($100,000) which they had deposited as guarantee.

By 1863 lines were completed to a length of nearly 2,200 miles, and others were projected or under construction for nearly 2,600 miles, calling for a capital of not less than $200,000,000.

Because of the political and financial conditions in general and because the concessions had been distributed among a great number of companies, capital was very difficult to obtain, securities being often negotiated at far less than their face value. The government finally decided that it would be better to combine all the projects toward unification of the entire Italian railway system. A company was formed for this purpose, but there was ceded to it only a fraction of the lines, difficulties arising in connection with the transfer of the others. Other projects proposed for the cession of the state lines to private companies were likewise without success.

A commission was finally appointed to devise a plan. Its report, favoring the purchase of the lines, brought about a long discussion in Parliament, which resulted in the law of 1865. This provided for the cession of the railways to four companies. The Company of Northern Italy took the lines of Lombardy, Piedmonte and Venice; the Company of Tuscany the lines of Tuscany, the Roman provinces and Liguria; the Southern Company the lines to the south of Rome as far as Calabria; the Victor Emmanuel Company the lines of Calabria and Sicily. The Sardinian railways were ceded to a fifth and separate company. This was a very expedient arrangement for the government, as it brought in $40,000,000 in cash at a time when it was badly in need of money and would have been obliged to increase its outstanding loans upon very unfavorable terms.

The various lines had been so distributed that there would be a certain competition between one system and another. Although the building of lines by the state had practically been brought to an end, the government continued to assume a certain responsibility in helping the private companies to meet their obligations under previous contracts.

It was hoped that the arrangement would endure for many years, but these hopes quickly fell because of the inherent weakness of two of the companies, and because of the financial stress imposed by the war of 1866 with Austria. The companies could not obtain needed additional capital. The government was called upon for subventions not yet due, but which it was obliged to pay, as it could not afford the national discredit that would follow upon the ruin of the railway.

The company operating the lines in Sicily and Calabria could not meet its obligations and the concession was annulled by the government in 1867. The company operating the lines in the Roman provinces and Tuscany next got into trouble. In 1868 the state relieved it of further responsibilities in connection with the Ligurian Railway and bought back other portions of the lines that had been ceded to it. Inasmuch as the government could not raise the $9,000,000 required to complete this purchase it turned the lines over to the more prosperous company of the north. The company operating the lines to the south of Rome had also become involved, making necessary heavy drafts upon the national treasury. In the face of increasing disaster to one company after another, expedient after expedient was adopted by the government until finally in obedience to growing popular sentiment that the ownership and control of all the railways should be vested in the state, it determined in 1875 to repurchase the lines, even including those in the north of Italy that had been fairly prosperous under the concessionaire company. In 1876 the greater part of the Italian lines that but eleven years before had been ceded to private corporations were again in the hands of the government, and negotiations subsequently completed with the Austrian government secured to it complete ownership of the northern lines. At this time there were about 5,000 miles in operation.

The lines of the peninsula were divided longitudinally into two systems, the Mediterranean and the Adriatic, the Sicilian lines being operated separately. One ministry after another took up the question of the extension of the railway system, and in 1879 a law was passed authorizing the expenditure of $252,000,000 for the construction of supplementary lines which were to be operated by private corporations. A project brought forward in 1879 for the cession of the Mediterranean and Adriatic companies to private corporations was finally consummated under an arrangement whereby the government received a rental of $9,000,000 a year.

The government had made and continued to make large appropriations for the supplementary lines. These had been badly surveyed. A multiplicity of offices had been created and filled

with incompetent incumbents whose conflicting opinions led to general mismanagement. Construction had been inaugurated that vastly exceeded the appropriations and there was finally a general investigation. In 1884 revisions were made in the plan of operation of the Mediterranean and Adriatic systems, and capitalists of Sicily were brought into the administration of the lines of that island.

The matter of extending aid to the railways came up at every session of parliament. One appropriation after another in which the participation of provinces and communities was enlisted was made for repairs and improvements and for the purchase of rolling stock. By 1899 the governmental subvention to the supplementary lines amounted to from $1,200 to $1,500 per mile, but with all the assistance that they received these lines were not completed and a royal commission was appointed to devise ways and means.

Large expenditures had also been made upon the lines in Sardinia, for the construction of the Mt. Conis, St. Gothard and Simplon tunnels and the approaches thereto.

The capital expenditure given by the government as having been made up to June 30, 1903, was $980,000,000. This covered 10,320 km., making the average over $95,000 per mile. The total expenditure of the government for initial capital, guarantees of interest and subventions to this time amounted to very nearly $1,300,000,000, not including the payment to be made in annual instalments until 1954 of the $600,000 due to the Austrian government on the purchase of the railways of Lombardy. The annual payments for which the state had made itself responsible on account of the railways approximated $50,000,000, which was about one-seventh of the annual revenues of the kingdom. As an offset, by way of taxation on transport, upon the holders of railway bonds, upon the salaries of railway employees, and from savings by transportation performed gratis or at reduced rates on government account, the state received an estimated annual total of over $20,000,000. To meet its obligations in connection with the railways it has had to resort to financial operations which occasioned severe loss. For example, one issue of securities of a face value of $200,000,000 brought less than $126,000,000.

The situation was going from bad to worse. Although the concessionary companies had paid dividends that in some cases had been as high as 7, and in others as low as 3, per cent., they had been able to do so more by the aid of the government than by the earnings. On April 22, 1905, a law was passed providing for the resumption by the government of the lines of the Mediterranean, Adriatic and Sicilian companies and of certain minor lines. This law decreed a provisional organization to take effect July 21, 1905. On July 7, 1907, was enacted the law for the organization of state operation of the railways not granted to private corporations, which is substantially that in effect at this time. It provides that lines may be taken over by the state when their concessions have expired by royal decree upon advice of the Council of Ministers and with the approval of parliament. In other cases the assumption of state operation or the extension of corporate operation is to be authorized by special enactment.

It was desired to make the administration of the railways free from political as well as financial influence. They were, therefore, placed under the direction of a director general, who is appointed by the king upon nomination of the council of ministers. There is a council of administration, composed of eight members chosen in the same manner. Two are high railway officers, three high officials of the state and three citizens of administrative capacity. This council approves proposals for extensions, purchases and contracts; authorizes litigation; directs the disposition of rolling stock and track and station adjustments at junction points. It passes upon appointments, promotions, increases of salary, dismissals and retirements. As the minister of public works has the power of veto of the actions of the railway administration council, it is evident that the freedom of the railway administration from political influence is nominal rather than actual.

The director general passes upon proposals and contracts and decides other matters in which the amount involved does not exceed $1,000, $2,000, or, in some cases, as much as $10,000.

There are two assistant directors general, having prescribed duties. There are twelve central bureaus, each in charge of matters pertaining to a particular line of administration. The immediate operation is conducted through ten divisions, each in charge of a division director, each of whom has three assistants, dealing respectively with matters pertaining to traffic, operation and maintenance. Changes in the tariffs are made by royal decree upon the recommendation of the minister of public works after they have been agreed to by the ministers of the treasury, agriculture and industry following the deliberation of the council of administration. After a tariff has remained in effect a year it is presented to parliament to be enacted into law. Special and temporary reductions in rates are allowed under contract with individual shippers by the director general, with the approval of the minister of public works and the agreement of the minister of the treasury.

A general board of traffic works out the details of propositions for changes in rates and gives advice upon all subjects submitted to it by the minister of public works and by the administration of the railway. This board is composed of three representatives of the state railways, who are appointed by the railway administration, of functionaries of the various ministries chosen by the minister of public works; of representatives of the steamship companies, the tramways, the chambers of commerce, the agricultural societies, the railway employees, the political press and eight other members chosen by the minister of public works because of their expert knowledge in connection with railways.

There is also a traffic board connected with each of the ten directions which studies matters and makes recommendations in connection with the local tariffs, the local time-tables and the needs of the local traffic.

When the state came into control of the railways in 1905 it made great reductions in the passenger fares, introducing the tapering tariff. It also made considerable reductions in the freight rates.

For the last year of operation by the companies in 1904-05, covering 7,510 miles, the total receipts were 357,466,038 lire ($71,493,208); the total expenses, 291,887,831 lire ($58,377,566), leaving the net revenue 65,578,207 lire ($13,115,641). During the first year of exploitation by the State (1905-06), covering 7,000 miles, the total receipts were 351,993,309 lire ($70,398,662); the total expenses, 291,702,735 lire ($58,340,547); the net revenue, 59,290,574 lire ($12,058,115). For the year 1907-08 for 8,345 miles the total receipts had increased to 473,128,768 lire ($94,625,154); the total expenses to 429,769,944 lire ($85,953,989), leaving a net revenue of 43,358,824 lire ($8,671,756). The proportion of operating expenses to receipts increased from 68 per cent. in 1903 to 74 per cent. in 1908. The cabinet that went out of office toward the close of 1909 owed its failure partly to the fact that it had proposed a general increase in the tariffs of the railways.

Under the different regimes by which the railways have been conducted the freight tariffs have attained a complexity with whose intricacies, but few even of the railway officials are familiar. The underlying scheme perhaps resembles more nearly that of Belgium than any other country. The simplification of the tariffs is one of the tasks that confronts the railway administration. In its scheme of accounts the government does not charge to the railways the cost of the existing plants. They assume, however, the interest on $106,000,000, the amount in which the government was indebted to the private companies and which was included in the payment made by it at the time of purchase.

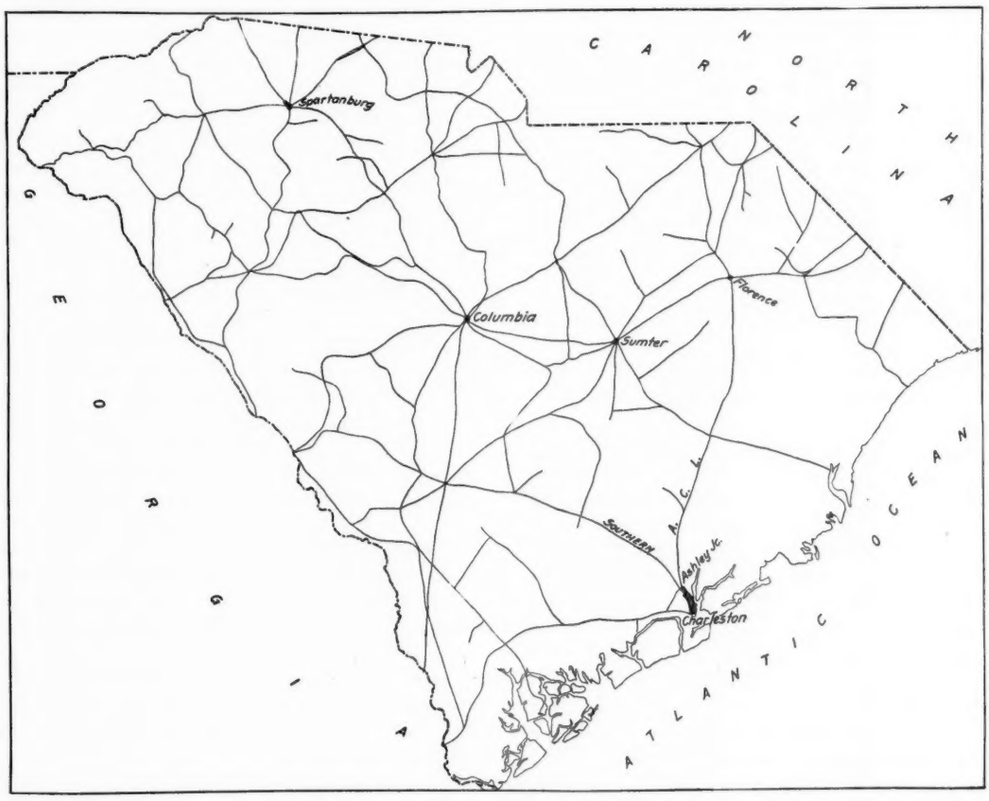
It is argued by the supporters of state operation that the companies in the last two years of their existence allowed plants and equipment to deteriorate, ran but few trains and at slow speeds, gaining large profits because of the great volume of business, the whole of which they were not able to handle; that the state has increased the number and speed of trains and radically improved the service, to the general satisfaction of the people, while having to face the increased cost of materials and supplies that has pre-

vailed in Italy as well as in other countries. Those opposed to state operation claim that it is bureaucratic and inefficient, that the number of employees has been increased far beyond any need, that the purchases of material and expenditures generally have been utterly beyond reason, and say that with a vastly increased equipment the net earnings should have increased instead of diminished.

As the needs of the Italian population are simple, their consumptive capacity is low. Because of this and the fact that the self-sufficiency of the community has prevailed throughout this country as elsewhere in Europe, the development of interior traffic has been a slow process. Imports and exports come and go through the seaports, of which there are so many that long hauls by rail are exceptional. The development of manufacturing in northern Italy and of the growing of fruits and vegetables in the south, as well as the production of wines, are, however, bringing a change in this respect, the sending of the products of the farms and vineyards to the north and the manufactures of the north to the south creating a reciprocal flow of traffic. The balance, however, is greatly in favor of the south, a large proportion of the cars sent north returning empty. To encourage the marketing of fruits, vegetables and wines in the northern countries of Europe the Italian railroads have made especially low rates on such shipments which are now generally carried in through cars to the places of destination. The cars in use for the most part have a capacity of 10 to 15 tons, attempts to introduce 20-ton cars not having met with success.

DOUBLE TRACK IN SOUTH CAROLINA.

The eighteenth state to be dealt with, in our series of maps of double track railways, is South Carolina, which is shown in the accompanying drawing. The only lines of more than one track



Double Track Railways in South Carolina.

that we can find are the following, double track: Atlantic Coast Line, Charleston to Ashley Junction, 6 miles; Southern Railway, Charleston to ————, 6 miles, and Spartanburg to Spartanburg Junction, 2 miles.

DEVICE FOR MARKING TARE ON CARS.

On the Atchison, Topeka & Santa Fe the weight is marked on freight cars by means of metal figures instead of by painting, and the new method obviates the delay incident to painting and also saves the cost and bother of switching to the painters' track. The method was described by Mr. Maegly, assistant general

Metal Numbers for Marking Cars.

freight agent of the road, at the recent meeting of the Association of Transportation and Car Accounting Officers at Colorado Springs. The device consists of a metal holder, 8½ in. wide and 7½ in. high, nailed to the side of the car. The light weight of the car, together with the name of the station at which the weighing is done, and the date, is then set up in metal figures in an interchangeable filler which is inserted in the holder, and all of the letters and figures show through the openings made in the metal holder.

The scale ticket bearing the information from which the filler is set up is made in triplicate, and one copy is placed within the filler, where it is protected from rain, and goes with the car; thus it is possible at any time to compare the marks on the car with the ticket, which is the original record. Additional information regarding special conditions under which the car was weighed, such as wet weather, can also be noted on the scale ticket.

The light weight marks with the ticket hidden behind them are made secure from tampering by sealing with a self-locking progressively numbered seal or by the ordinary car seal, the wire or strip being fastened through the holder and the interchangeable filler.

With this device the light weight marks may be placed on cars without delaying them. The weighmaster may set up in advance the station symbol, the number of the month and the

year, leaving only the first three tare weight figures to be set up after the weight has been ascertained. This process requires but a few seconds time; and as soon as the holder has been sealed the car is ready for service, eliminating entirely all delay incident to switching to the paint track, the painting out of

Marking a Santa Fe Freight Car.

the old numbers, the application of the new marks and the detention necessary for drying. In addition to this, the possibility of error is greatly reduced because of the fact that the stenciling is done in conjunction with the weighing, and the responsibility is centered in the authorized weighmaster, eliminating the present divided responsibilities existing between the station and the car department employees.

NOTES ON WOOD PRESERVATION AND CREOSOTE PRODUCTION IN EUROPE.*

BY E. A. STERLING.

The first comprehensive manual in English covering the preservative treatment of wood in a broad and practical way, and embodying the results of both American and European experience, is yet to be written, so we must depend for the present on the fragmentary information available.

To discuss even the fundamentals of the timber-treating business would lead beyond the limits of a brief paper, and in addition would be a recapitulation of what is already familiar to most engineers; so the author will try to confine himself to actual observations made while in Europe last fall, and these even will be very incomplete, for the whole field could not be covered short of several years' investigation.

The preservative treatment of timber is almost universally practised throughout Great Britain and all the countries of western Europe; the most intensive application of the work being in England, France, and Germany, although much treated material is used in Belgium, and the work is being taken up on a large scale in Italy, Norway and Sweden. The material treated includes railway ties, mine props, construction timbers which are exposed to the weather, fence-posts, telegraph poles, grape stakes, etc.

The Germans probably have more to teach us than any one else, for they have experimented with a greater number of preservatives and processes and are still working more or less along experimental lines. The French roads, on the other hand, have perhaps achieved the most substantial results, since they have long been advocates of straight creosote and have injected into the wood all that it would hold. The English roads have also been consistent users of creosote, and although they have experimented with other preservatives, the general practice has changed but little in recent years. Out of a total of 70 treating plants in the western countries of Continental Europe, 47 are in Germany, 14 in France, and 9 in Belgium. Of this total, 14, or 20 per cent., are railway plants, the remaining 56 being under private control, although much of their work is done for the railways and for the government telegraph and postal services. By countries, the 9 plants in Belgium are all private, while 6 out of the 47 in Germany and 8 out of the 14 in France, or 12 per cent. and 58 per cent., respectively, are owned by the railways.

It is known that Europeans have been achieving definite results in timber treatment for half a century, and it is therefore rather disappointing to find the mechanical equipment at their treating plants far inferior to the newer and better equipped plants in this country. Owing to the cheapness of labor, they have not learned to use mechanical devices to facilitate the handling of material in and out of the cylinder and in the yard, and practically everything is still done by hand in a way which in this country would appear slow and laborious. Their cylinders, as a rule, are small, and the doors heavy and cumbersome and slow to operate. The machinery is usually in keeping with the cylinders, and the pumps, etc., rarely have the capacity of those in this country. In one respect, however, their plants excel American, in that the buildings are usually of substantial brick construction and the heads of the cylinders are entirely shut off from the operating room.

The railways of Germany are naturally the largest consumers of treated material in the empire, and their policies reflect the general tendencies of the country. Nearly all of the roads are owned and operated by the states, and consequently there are a number of separate railway organizations, all controlled to an extent by a central committee which insures through traffic arrangements and somewhat uniform policies, although each road is independent in matters relating to wood preservation. The Prussian State Railway is the largest and most influential, and in the maintenance of some 25,000 miles of track uses from four to five million ties annually, about 40 per cent. of which are of metal. In the whole of Germany about eight million ties are consumed yearly, about 70 per cent. being wood.

It is in connection with the preservation of sleepers by the Prussian State Railway that the most striking recent change in policy has taken place. Zinc chloride, either alone or in mixture with creosote, has been extensively used, but during more recent years the full-cell process with straight creosote has been practically the standard, and many ties treated in this manner are now in track after twenty-five to thirty years' service. Despite these excellent results, however, an open-cell treatment of less certain value is being substituted for the full-cell process, the prime motive being the saving in initial cost resulting from the use of smaller quantities of creosote per sleeper. This so-called open-cell process adopted is covered by the Reuping patent, and although sound in principle and of practical application, it has not been thoroughly tried out from the standpoint of eliminating decay.

The Prussian State Railway has only two plants under its direct control, one at Northeim and the other at Zernsdorf; but there is a total of twenty-six plants in the state of Prussia which do work for the state railway.

Much of the railway treating work is done by the Rutgerswerke, a large corporation which owns and operates fourteen treating plants in Germany and several tar-distilling works, as at Rauxell, Berlin, and Manheim-on-the-Rhine. This company orginated the so-called Rutgers process, which is a treatment with a mixture of zinc-chloride and creosote, and for several years treated sleepers and other timbers by this method and also

*Abstract of a paper presented before the Engineers' Club of Philadelphia, February, 1910.

with zinc chloride alone. It was found, however, that the zinc chloride, either in mixture with creosote or separately, leached out rapidly, failed to give adequate protection from decay, and from the railway standpoint was unsatisfactory, because it caused the corrosion of spikes, plates, and rails in contact with it. Since their own process proved unsatisfactory, the Rutgerswerke has acquired the right to use the Reuping patent, and is rebuilding several of its plants so as to treat by this process. The Prussian State Railway, in turn, has accepted the Reuping treatment, and practically all of their work is being done by the Rutgerswerke. Although the Reuping patent has been in force only six or seven years, the Prussian State Railway engineers seem to have concluded that this treatment gives as deep a penetration as is possible by any method, is permanent, does not corrode metal which comes into contact with the treated wood, and that the saving in oil—and therefore in cost—justifies the change on grounds of economy as well as efficiency. Beech ties which were treated with 36 to 49 kilos [79 to 88 lbs.] of creosote by the full-cell process are now to be given a treatment of 16 kilos, while pine ties will be impregnated with 7 kilos, although 18 and 9 kilos, respectively, were recommended by the Rutgerswerke.

Another treatment which has been used to considerable extent in Germany, and of which little has been heard here, is the so-called creo-air process. This process eliminates the initial air-pressure, and the amount of creosote desired per cubic foot, plus what will be drawn out by the final vacuum, is forced in. The pressure is then released, the oil blown back, and the oil which remains in the outer layers of the woods is distributed by an air-pressure running up to 175 pounds.

In addition to the two plants owned and operated by the Prussian State Railway, the state railways of Bavaria control one treating plant at Kirchseeon; the roads of Saxony, one at Wülknitz and another at Falkenstein; and the Würtemberg Railway, a plant at Zuffenhausen. Creosote is coming to be the standard preservative of all of these plants, as well as at most of the private plants, although mercuric chloride and zinc chloride are still used to some extent.

The plant of the Bavarian State Railways, at Kirchseeon, near Munich, has a capacity of about 600,000 ties a year, most of which are Scotch pine received by rail from the north, since Kirchseeon is in a Norway spruce region and very few treatable ties are produced locally. Occasional shipments of beech and oak are received, but they make up a very small percentage of the total. The creosoting equipment consists of three cylinders, each about 6 ft. in diameter, one being 40 ft. in length and holding five cylinder cars, and the two others about 32 ft. long and holding four cars. Two of the cylinders are side by side and are operated by one set of machinery, while the third is in another part of the yard and is operated separately. An interesting feature of the single cylinder is that the boiler is directly underneath it, the aim being to utilize the heat from the boiler in helping keep the cylinder warm. The mechanical equipment, from the American standpoint, is quite inadequate, one feature being the absence of oil-pressure pumps of any considerable size; while all of the machinery was found to be out of date and of insufficient capacity for rapid and effective work. All of the ties are thoroughly air-seasoned before being treated, and the hewn hardwoods are run through a primitive adzing machine operated by hand, in order to surface the portion of the ties under the rail. The average treatment requires about four hours, and the process consists of an initial vacuum, followed by the introduction of the oil; then an air-pressure of two atmospheres, which is held for about half an hour; the pressure is then dropped to zero, followed by another air-pressure of nine atmospheres, which is held for two to three hours; while at the end a slight vacuum is produced. The name of the process could not be ascertained, and it is likely a local treatment based on the experience at this particular plant. In addition to the pressure creosote treatment, a small number of ties were being treated with mercuric chloride by a non-pressure process, the solution being placed in a long series of open tanks into which the ties were introduced and kept submerged for about six days.

The most interesting features of the Kirchseeon plant are in connection with the yard, which is large, well laid out, and provides storage capacity for nearly 1,500,000 ties. A distinctly up-to-date feature was the use of an electric moving platform running transversely across the yard and bisecting all of the narrow-gage yard tracks at right angles. The cylinder cars are loaded at various points in the yard, run down to and upon the moving platform by hand, and transferred bodily to a point near the treating cylinders; then on to a turntable, where they are turned and run upon a track leading to the cylinders. Here, in striking contrast to the electric platform, is a hand windlass with which the trains are pulled in and drawn out of the cylinders. Two sawmills are located in this same yard and are operated in connection with the plant. Pine timber which comes from northern points is received in the log and these little mills saw this round material into sleepers and lumber. The close utilization practised in these sawmills would be a revelation to our lumbermen, every piece of wood being converted into some usable material; even fine inner bark was being shredded and shipped away for packing purposes. As a final provision for getting the most out of everything, a large dry kiln is maintained, in which lumber which would suffer from air seasoning is taken care of.

The plant of the Rutgerswerke at Custrin, near Berlin, is equipped with three cylinders, each about 6 ft. in diameter and 30 ft. long. This is one of the plants which has been equipped for the use of the Reuping process, and most of the charges are given this open-cell treament; although the creo-air process is occasionally used. The capacity of the plant by the Reuping treatment is about 3000 ties per day, the time required to put through a Reuping charge being about one and one-half hours, as against one and one-quarter with the creo-air process. Ties are treated for the Prussian State Railway and telegraph poles for the Imperial Post-office Department. The timber used is practically all pine, which is rafted down the Oder or Wartha rivers from the Baltic region. The ties are transferred rapidly from the river to the yard by a pair of endless chains, corresponding to the jack chains in a sawmill, which operates up the river bank at an angle of about 30 degrees and drops the ties into cars at the edge of the yard. In the yard the ties are piled by the 1 x 7 system and allowed to remain until thoroughly seasoned. The dimensions are 6½ in. x 10½ in. x 8 ft. 10 in. for No. 1 ties, and 5½ in. x 9½ in. x 8 ft. 10 in. for No. 2 ties. The treatment by the Reuping process penetrates the sap entirely, but forces no oil into the heart; while the creo-air process does not even completely penetrate the sap. In the treatment of the seasoned ties, the aim is to leave in about 7 kilos of oil per tie by the Reuping, and about 6 kilos by the creo-air process. The yard at Custrin presents no features of particular interest, the cylinder cars being transferred to the cylinder on a small moving platform drawn by a horse. The movement of the trains in and out of the cylinder is by means of a steam hoist and cable. All of the ties are surfaced before treatment and cut to a uniform thickness under the rail by a machine which automatically adjusts itself to any minor variations of thickness between the two ends of a tie.

The Rutgerswerke two-cylinder plant at Stendel was one of the most interesting visited. The mechanical equipment is better than at most of the European plants, and the results obtained in the treatment of beech—which is the only species used—are excellent. The air-seasoned beech ties are treated by the so-called "double Reuping" process, the absorption being about 16 kilos per tie and requiring about seven hours for each charge. The penetration by this process is practically complete for about two feet on each end of the tie, while a cross-section from the middle of the tie usually shows only two or three small spots which have not been touched by the oil. It is noticeable that the penetration was somewhat more complete in ties which had been treated and stored in the yard for some weeks than in those which had just come out of the cylinders; this being due

to the gradual absorption of the oil by the untreated portions upon cooling.

It is quite generally admitted, even by the advocates of the Reuping process, that conclusive data regarding the relative value of the full- and open-cell treatments are not available, because the latter has not had the test of time. In order to hasten decay and obtain quicker comparative results, a very interesting "fungus pit" is maintained at Stendel, in which conditions favorable to the decay of test pieces of treated and untreated wood are created, and definite series of experiments are carried on to determine the relative efficiency of different processes. The decay chambers are underground in what amounts to a cellar with concrete walls and floor, underneath a small brick building which is used for a museum and laboratory. This cellar is partitioned off into four small rooms, one containing the heating apparatus, another being used for the propagation of various species of fungi, and the other two as test rooms. The temperature in the decay pits is maintained at from 63 deg. to 70 deg. F., and moisture is provided for by pockets in the concrete wall and also by keeping a stream of water flowing between the concrete wall and a false wall of brick. The wood-destroying fungi are propagated in zinc-lined boxes on small blocks of wood, which are used as needed for infection purposes by placing them in contact with the test pieces in one of the other rooms, the fungi on the infected pieces developing through the dissemination of spores or by the direct growth of the hyphal threads. The conditions produced in this way are so favorable to the decay of wood that untreated pine rots entirely away in seven or eight months, thus giving comparative results as between treated and untreated woods, and between different methods of treatment, in a very short time.

In France there have been no recent changes in the methods of treating railway timbers, the full-cell process with creosote being exclusively used, although for some years zinc chloride and other mineral salts were in favor. Open-cell processes and metal ties are condemned by most of the railways, and the conclusions are probably sound, because based in most cases upon actual experiments. The French state railway some years ago made extensive experiments in reducing the amount of creosote used per tie, but it was found that the ties decayed more rapidly, and the cheaper treatment was abandoned. Similar experiments have been made by the Paris, Lyons & Mediterranean with the same results, and the sentiment seems to be that the injection of large doses of oil will be the most economical in the long run, although the initial expense, of course, is materially higher. The latter road owns and operates two plants and uses the product from three private plants. The State Railway of France owns three plants; the Northern Railway of France, three; and the Eastern Railway, one.

The experience of the Paris, Lyons & Mediterranean is, perhaps, typical, this road using about 1,000,000 creosoted ties per year, mostly of beech, although small quantities of oak and pine are used. Creosote is the only preservative considered, and no untreated ties are put in the track. Their No. 1 sawed ties are 6 in. x 8½ in. x 8 ft. 8 in. The untreated ties, delivered at the treating plants, cost about 85 cents for beech and from 60 to 75 cents for oak and pine. With a 20 to 30-lb. treatment of creosote per cubic foot, beech ties give a life in track of from twenty-five to thirty years, the treatment costing from 45 to 80 cents.

The practice of the English roads in creosoting ties offers little that is new or instructive. With the exception of the London & Southwestern, which still uses the open-tank treatment, most of the roads treat under pressure and specify a full-cell treatment. The material used is mainly Baltic pine obtained from continental Europe. Very little experimental work is done, and, with the exception of 50,000 ties treated for the Great Northern by the Reuping process, little or no attempt has been made to economize in the use of oil by an empty-cell process. Most of the roads control one or more plants, but at the same time depend to a large extent on private concerns for creosoting their material. The general practice of renewing certain sections of track periodically instead of "spotting in" the ties, as is the custom on American roads, results in the fullest use of the creosoted ties. It is not uncommon for ties to remain in the track for ten years, when they are taken up and the majority used again in main-line track for another ten years, at the end of which time those which are in fairly good condition are taken up and put in side tracks. The result is that from twenty to thirty years' use is obtained from a considerable percentage of the creosoted ties.

The two main sources of supply of creosote are Germany and England, practically all of the other European countries deriving most of their supply from these producing countries, but mainly from Germany.

The German distillation plants which produce most of the creosote for the American export trade are in the coal and iron districts of Westphalia. The oil produced at the various works is shipped by barge to Amsterdam, Holland, or to Emden, Germany, where it is assembled in large shore tanks and thence pumped into tank steamers for export. The creosote produced in the plants of eastern Germany, Posen, and Silesia is disposed of locally or shipped to France and Italy. A German syndicate of tar producers and distillers practically controls the whole creosote industry on the continent. While the individual concerns making up the syndicate sell part of their output locally as they find a market, the greater part of the creosote produced is disposed of by a selling syndicate which represents the combination of producers and distillers. This selling syndicate entirely controls the export business, and the American consumer cannot hope to go into the German creosote market and bid for oil on a competitive basis. Fortunately, the standard set is high and the oil assembled for American trade is of uniformly good quality and is available at reasonable cost. It is obvious, however, that the German supply cannot long meet the rapidly increasing American demand, and it is not at all unlikely that there will shortly be a scarcity of creosote oil.

England is the only other European country producing creosote oil for export, and the situation as regards supply is somewhat similar to that in Germany. The London creosote is distilled almost entirely from tar produced at illuminating gas plants, whereas the "country oils" are derived largely from coke-oven tar, and, as a rule, are lighter and of poorer quality than the London oil. The tar distillation in England is not, as a rule, carried as far as in Germany, with the result that the percentage of solid napthalene and anthracene is higher. The relative value of German and English oil for wood-preserving purposes is an unsettled question; the American consumers have rather decided opinions on the matter, so that the present demands for oil are somewhat equally divided between the two countries. Aside from the difference in general characteristics, there are undoubtedly more variations in the English oil than in the German, and the general market is in a more unstable condition. The British producers and exporters at the present time are working independently, with the result that there is keen competition and the prices fluctuate through rather wide limits in accordance with the amount of oil available at any particular time.

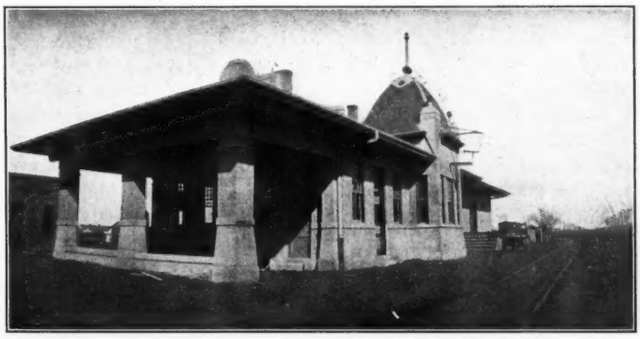
The importations of creosote oil into the United States, which in 1905 amounted to about 8,000,000 gallons, had by 1909 grown to nearly 40,000,000 gallons, or an increase of 400 per cent. Out of the total creosote consumption in this country of about 56,000,000 gallons in 1908, 69 per cent. was imported, while in 1903 the total amount used was only 7,700,000 gallons. This is an average increase of nearly 10,000,000 gallons per year, and it is certain that if this continues at anything like the present rate, there will be a serious shortage of creosote in a few years. The supply in both England and Germany is unquestionably limited, and although the output of the latter country can be increased by perhaps 50 per cent., part of this will have to go to local consumers and to other European countries. The ultimate solution of the creosote supply question should be home production. There is enough tar wasted in our beehive coke ovens

to furnish creosote for all consumers, and even now, if the tar output of American by-product plants was refined, it would go a long way toward meeting present creosote requirements. The two principal factors responsible for the inadequate American creosote output to-day are the high initial cost of by-product plants and tar distillation works, and the lack of a market for some of the coal-tar products. The value of the creosote alone will not justify the distillation of tar, but American industry will not be maintaining its reputation if ways and means are not found by which the tar now produced or going to waste in this country can be made to yield the creosote and other coal-tar products which are needed.

REINFORCED CONCRETE DEPOT AT GRAND PRAIRIE, TEX.

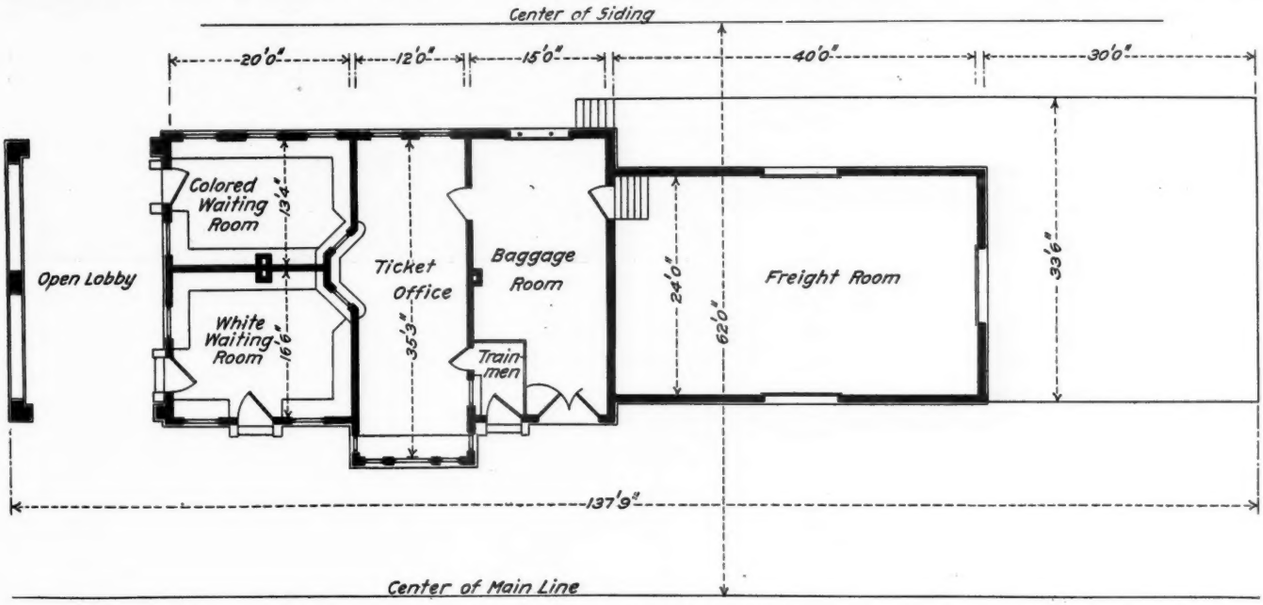
The question of economy in first cost is so often paramount when erecting stations and depots in small towns and cities that it is refreshing to note the character of buildings being erected by the Texas & Pacific, the station at Grand Prairie, Tex., standing as a good example. This structure is of reinforced concrete and is massive in appearance, as becomes a masonry building. The eaves are wide and the pitch of the roof low, the result being a building of pleasing architecture and suitable to a mild climate. While the first cost of this building is greater than that of one built of wood, it is practically indestructible, and, therefore the maintenance cost will be low. A concrete building rather improves in appearance with years, whereas a wooden building, such as would undoubtedly have been erected at this point if precedents had been followed, deteriorates rapidly in appearance with age, and the maintenance cost continues to increase.

The total cost of the building at Grand Prairie was $6,315. The concrete work in foundations, walls, columns and floors, was done by contract for $3,061. All other work, including painting, was done by company forces at a cost of $3,254.

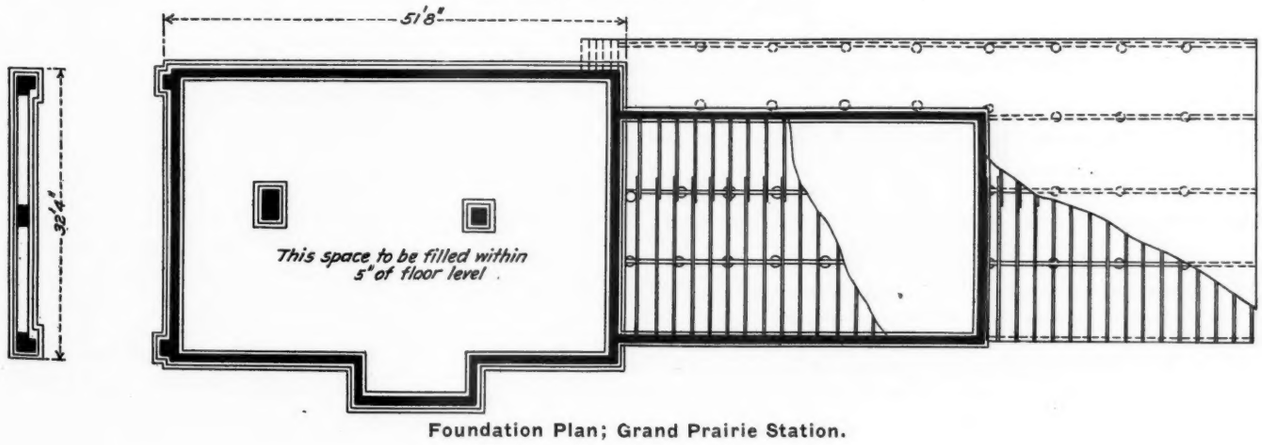


Station at Grand Prairie; Texas & Pacific.

The walls are of reinforced concrete, cast in place, having ¾-in. cold-twisted steel bars, placed horizontally and vertically on 18-in. centers, the concrete being composed of one part cement, two parts sand and four parts gravel. There is very little wood used in the building, the greater part being in the roof trusses and the freight platform; the wood used being long leaf pine.



Floor Plan; Grand Prairie Station.



Foundation Plan; Grand Prairie Station.

The roof covering is a metal shingle made by the company from selected metal roofing of dismantled cars.

We are indebted to B. S. Wathen, chief engineer of the Texas & Pacific, for the illustration and description of the building.

POOR'S MANUAL FOR 1910.

Poor's Manual of Railroads for 1910 (43d annual number) was issued this week. It contains 2,685 pages of text and is about 25 per cent. larger than the 1909 edition. The present number is devoted exclusively to statements of the railways and street railways, the statements of industrial corporations having been incorporated in a separate volume, "Poor's Manual of Industrials," a book of 2,300 pages, which was issued last May. The Manual this year appears in a new and very attractive type, larger and more legible than the type used in former editions.

A new feature of the 1910 edition is the large number of tables which will aid the reader in analyzing the financial strength and the operating efficiency of the important roads.

The editor finds the total length of steam roads on December 31, 1909, to be 238,356 miles, as against 232,046 miles on December 31, 1908, showing an increase of 6,310 miles.

The gross earnings for 1909 of the roads reporting, as shown below, were $106,192,953, or 4.41 per cent. larger than in 1908, and the net earnings $134,351,113, or 18.72 per cent. larger.

The following table shows the principal summary for all steam roads of the United States at the close of 1909, as compared with the close of 1908:

	1909.	1908.
Capital stock	$8,030,680,963	$7,641,913,086
Bonded debt	9,118,103,813	8,788,518,045
Other bonded obligations	793,497,799	804,455,084
Accrued liabilities	151,319,542	109,013,608
Miscellaneous liabilities	118,567,836	113,461,262
Bills payable and current accounts	933,646,991	940,361,739
Sinking funds, etc.	311,448,385	246,833,997
Profit and loss	919,823,188	831,298,738
Total liabilities	$20,377,088,517	$19,475,855,559
Cost of railroad and equipment	$14,514,822,308	$13,902,227,797
Stocks and bonds owned	3,084,387,008	3,012,575,629
Real estate and other investments	907,873,063	926,287,633
Cash, bills receivable and current acc'ts	1,163,176,374	1,011,685,994
Material and supplies	213,124,839	223,784,568
Other assets	185,324,625	171,203,159
Sinking funds	177,859,392	122,313,373
Profit and loss	130,520,908	105,777,406
Total assets	$20,377,088,517	$19,475,855,559
	1909.	1908.
Miles of road operated	237,867.79	228,285.73
Earnings—Passenger	$578,243,601	$575,246,516
Freight	1,720,863,413	1,650,989,952
Other	214,105,749	180,783,342
Total gross earnings	$2,513,212,763	$2,407,019,810
Net earnings	$852,153,280	$717,802,167
Other receipts	165,888,557	183,380,314
Total net income	$1,018,041,837	$901,182,481
Deductions: Taxes	$90,790,949	$82,377,619
Interest on bonds	318,755,456	304,475,354
Other interest	33,919,466	30,605,970
Dividends on stock	265,162,298	237,565,078
Miscellaneous	108,312,393	108,749,192
Rentals—Interest	34,406,772	36,308,746
Dividends	30,199,751	30,008,582
Miscellaneous	28,633,163	21,647,564
Total deductions	$910,180,248	$851,738,105
Surplus	107,861,589	49,444,376
Revenue train-mileage: Passenger	$519,262,551	$510,699,062
Freight	589,309,266	589,323,097
Mixed	32,734,351	32,340,149
Total	$1,141,306,168	$1,132,362,308
Passengers carried	924,423,075	891,275,003
Passenger mileage	29,896,152,391	28,985,670,148
Revenue per passenger-mile	1.934 cts.	1.964 cts.
Tons freight moved	1,635,215,800	1,521,065,494
Freight mileage	227,198,932,735	215,698,911,350
Revenue per ton-mile	0.757 cts.	0.767 cts.

NEW YORK CENTRAL COMBINATION BUFFET, BAGGAGE AND MAIL CAR.

The accompanying photograph shows an interior view of the buffet portion of car 473, which was recently rebuilt as a combination buffet, baggage and mail car at the West Albany shops of the New York Central & Hudson River. This car is now in service on the Lake Shore Limited and on the Twentieth Century Limited trains.

The interior shown, finished in mahogany, is plain, and this, with the beam ceiling design, has the effect of increasing the large and roomy proportions of the compartment. The 19 large comfortable chairs, made at West Albany, are of mahogany to conform to the finish of the car. They are upholstered in green leather, which matches the carpet. The lighting is provided by concealed center and side electric lamps, power for which, with the lighting of other parts of the car, is generated by a 60-volt Gould axle-driven generator. The car is heated by the Ward vapor system and ventilated by eight Garland ventilators.

The car is 75 ft. 6 in. long, 10 ft. 1¼ in. wide and 14 ft. 8 in. high over all. It has a total weight of 136,700 lbs. The

Interior of Buffet Compartment.

passenger compartment is 27 ft. 9 in. long, and the baggage compartment 22 ft. 1½ in.

The following additional special equipment is included:

Bath	Shower
Brakes	Westinghouse, type L
Brake-beams	Waycott
Centering device	Chaffee
Couplers	Tower
Door checks	Blount
Dust collector	Centrifugal
Draft gear	Miner spring
Oil boxes	Taylor
Platforms	Commonwealth steel
Slack adjuster	American
Step treads	Safety
Trap doors	Edwards steel
Window steel	Edwards
Wheels	Steel tired

EMPLOYER'S LIABILITY IN NEW YORK STATE.

The following is a synopsis prepared by the *Journal of Commerce* of the Employers' Liability acts which went into effect September 1 in the State of New York:

1. The "Fellow Servant" Rule is Greatly Modified.—The fellow servant rule of law, which relieved employers from liability for accidents caused by an act of a fellow workman of the injured workman, is amended so that hereafter the employer is liable for the act (causing an accident) of any person in his employ when such person is intrusted with any superintendence or intrusted with authority to "direct, control or command" any employee, thus greatly increasing the employers' liability, as it brings within the scope of the amended law a large percentage of all accidents.

2. "Assumption of Risk" Abrogated.—The amendment does

away with the rule of law of "assumption of risk," under which a workman by continuing at work with knowledge of dangerous or defective conditions was held to have assumed the risk and therefore was not entitled to recover damages resulting therefrom. This reversal of the old rules adds much to the employers' liability.

3. "Contributory Negligence."—Burden of Proof Placed on the Employer.—The rule of law (previous to this amendment) was that a workman who had been guilty of contributory negligence, however slight, in connection with an accident, could not recover damages for injuries, even though the accident was due in part to the negligence of the employer. Heretofore in all such cases the workman has been required to prove not only the negligence of the employer, but that he, on his part, was free from contributory negligence. The law as amended changes this rule and places upon the employer the burden of proving the contributory negligence of the workman. This amendment will be especially advantageous to the workman's family in death cases where the injured workman by reason of his death is unable to testify and may have been the only witness to the accident.

4. Defects for Which the Employer Is Now Liable for Damages.—The old law made the employer liable for damages arising from accidental bodily injuries caused by negligent defects in "the ways, works or machinery" used in his operations. The law is amended by the addition of the word "plant." This amendment makes the employer liable for many accidents to his workmen for which he has heretofore not been liable.

5. Notice of Accident.—The act amends the provision of the old law requiring specific service on the employer of a notice of the "time, place and cause" of the accident, by providing that unless such notice to the employer, if defective, is returned by the employer to the injured workman within eight days with a demand for a further notice, which demand must specify the particulars in which the first notice is claimed to be defective, the employer shall be considered as having waived all defects in the first notice. This new provision of the law practically makes any kind of "notice" legal notice.

6. The Employer Is Made Liable for Injuries to the Workman of His Contractors and Sub-Contractors.—The law as amended creates a new liability by making the employer liable to the workmen of his contractors and sub-contractors engaged in doing any part of the employer's work, for injuries caused by defects in the condition of the ways, works, or the machinery or the plant belonging to the employer.

New Doctrine of Workmen's Compensation.—The enactment of Chapter 674 entitled "An Act to amend the labor laws in relation to workmen's compensation in certain dangerous employments," which also goes into effect September 1, introduces in this country an entirely new doctrine as respects the liability of employers' to employees, the doctrine of "compensation" to injured employees irrespective of the question of negligence, as distinguished from the old doctrine of "damages" to the employee because of the negligence of the employer. This law specifies eight classes of employment:

1. The erection or demolition of any bridge or building in which there is, or in which the plans and specifications require, iron or steel frame work.

2. The operation of elevators, elevating machines or derricks or hoisting apparatus used within or on the outside of any bridge or building for the conveying of materials in connection with the erection or demolition of such bridge or building.

3. Work on scaffolds of any kind elevated twenty feet or more above the ground, water, or floor beneath in the erection, construction, painting, alteration or repair of buildings, bridges or structures.

4. Construction, operation, alteration or repair of wires, cables, switchboards or apparatus charged with electric currents.

5. All work necessitating dangerous proximity to gunpowder, blasting powder, dynamite or any other explosives, where the same are used as instrumentalities of the industry.

6. The operation on steam railways of locomotives, engines, trains, motors or cars propelled by gravity or steam, electricity or other mechanical power, or the construction or repair of steam railway tracks and road beds over which such locomotives, engines, trains, motors or cars are operated.

7. The construction of tunnels and subways.

8. All work carried on under compressed air.

In these dangerous occupations, a workman injured from any cause due to a necessary or inherent risk, or to the failure of the employer, or boss, or a fellow employee to exercise due care, or to obey any law, shall receive half pay during his disability, beginning two weeks after the injury and extending not over eight years. If he is killed, his dependents shall receive a sum equal to 1,200 days' wages. If he has no dependents, the employer is to pay his necessary medical and funeral expenses, not exceeding $100. The employer is excused from liability for deaths and injuries only in case of serious and wilful misconduct on the part of the employee. If an employee sues an employer under his previously existing rights, he loses the advantage of the new law; and if he sues for compensation under the new law, he cannot thereafter sue for damages under the old laws. The maximum disability benefit is $10 a week and the maximum death benefit $3,000. In computing the wages-rate of a man who is injured, regard shall be had, not only to what he was earning, but to what he will be able to earn after injury. An injured employee must submit to medical examination, at the expense of the employer, and to subsequent examinations, while disabled, not oftener than one in six weeks. An employer having compensated a contractor's employee may recover from the contractor if the contractor is liable, at law, for damages on account of the injury. The new law does not prevent an injured employee from suing a contractor or a sub-contractor.

STRENGTHENING OLD TRESTLES ON THE WABASH RAILROAD.

At the time of the construction of the Wabash Railroad the Phoenix column was the preferred type of column used in trestles intended to be permanent, and a number were erected by this company, the material being wrought iron. There has been a fear that in the intervening years some concealed deterioration might have taken place in them, and the trestles are now too light for the increasing loads of modern railway operation.

With a view to preventing rust on the interior of the columns, and also to stiffening them, a number of Phoenix columns in the approach of the bridge over the Missouri River at St. Charles, Mo., were filled with concrete a few years ago. Tests made in 1903 for the company showed that the filling of the columns with concrete had a tendency to give considerable increased strength and markedly increased the stiffness. The columns being 8 in. in diameter, the openings in the top through which the concrete could be poured were necessarily very small, and the concrete was poured in the form of a thin grout. It is believed that some of the grout was poorly mixed, causing sand pockets throughout the columns, and especially near the tops. The rain would get into the columns and fill the sand pockets. In the winter the water froze, and near the top the rivets broke as a result. While this was not general, there were enough instances of the kind to make it necessary to do something further really to strengthen the trestles.

To determine the effect of concrete on the exterior, thus converting the iron columns into reinforced concrete columns, two tests were made at the University of Illinois in April, 1909. An 8-in. Phoenix column 27 ft. long was taken and a length of 5 ft. cut from one end. The thickness of metal was 5-16 in. with an area in cross section of 12 in. The weight was 188.5 lbs. This short piece was tested as a plain column. The ends were

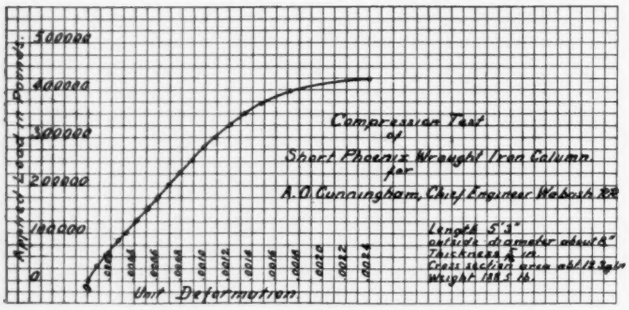

Applied Load in Pounds
500000
400000
300000
200000
100000
0
Compression Test of Short Phoenix Wrought Iron Column for A.O. Cunningham, Chief Engineer Wabash RR
Length 5'3" outside diameter about 8" Thickness of metal 1/4 in. Cross section area about 12 sq. in. Weight 1885 lb.
Unit Deformation

Fig. 1—Test of Phoenix Column.

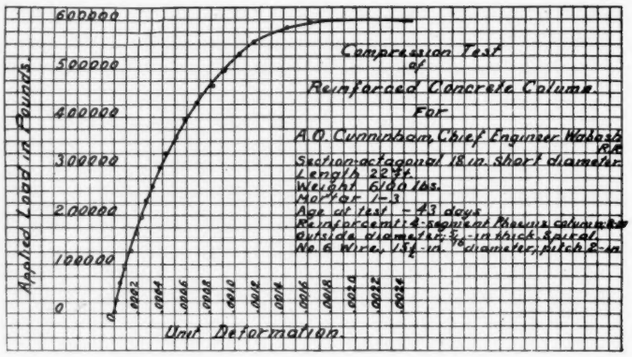
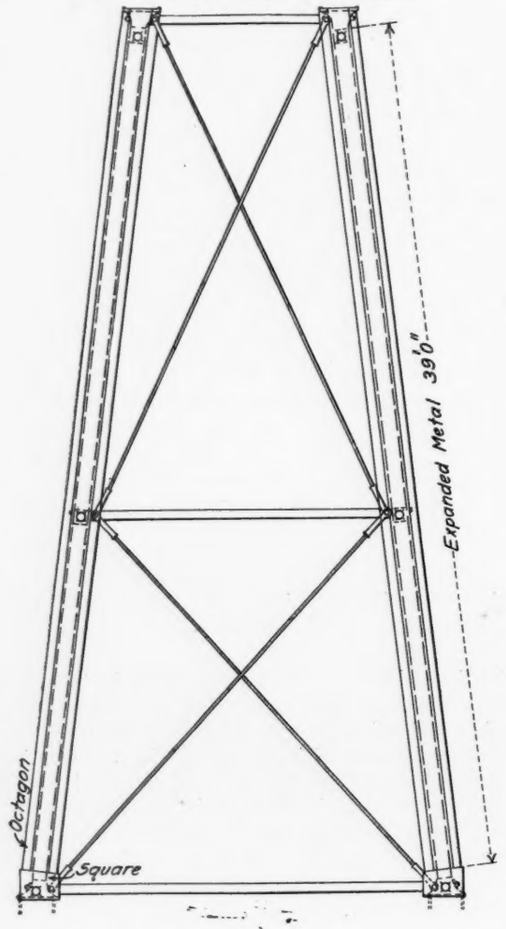


Fig. 3—Test of Reinforced Column.



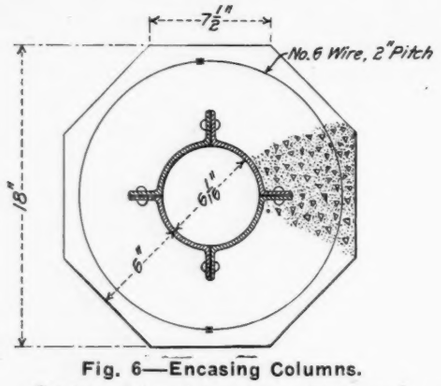
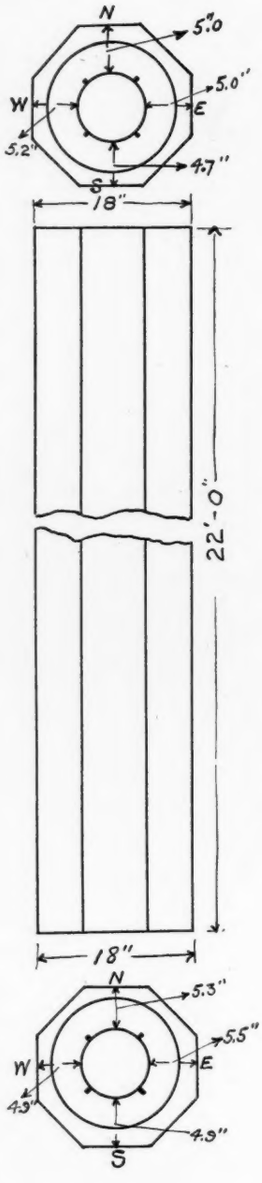


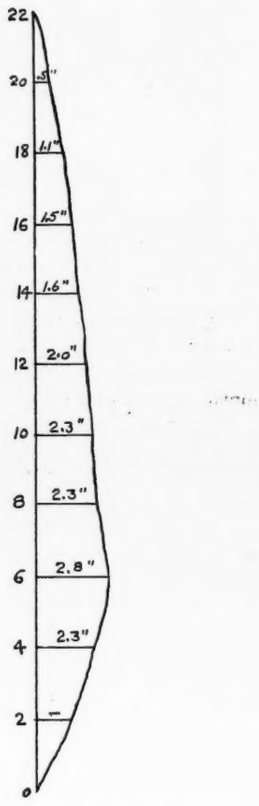
Fig. 6—Encasing Columns.

Concrete mixture, 1 part cement, 3 parts sand.

Area of section	1.875 *sq. in.*
Area of steel column	0.083 *sq. in.*
	1.792 *sq. in.*
0.0590 *cu. yds. concrete per lin. ft. outside of column.*	
0.0074 *cu. yds. concrete per lin. ft. inside of column.*	
Total	0.0664 *cu. yds. concrete per lin. ft.*



Reinforced Concrete Column.



Outline of S.E. face after failure.

Fig. 2—Test Column.

carefully squared in a lathe before testing, and an adjustable bearing block was used. Two extensometers were attached to measure the shortening of the column over a gaged length of 50 in. The load-deformation diagram for this column is shown in Fig 2, with some notes on the test in Table 1. The column had shortened about one inch before the test was discontinued. Cracks opened between the rivets in the vertical joints, and the flanges showed buckling in many places during the later stages of the test.

TABLE 1.

Total applied load, lbs.	Average unit shortening.	Remarks.
5,000	0.0	Initial load.
28,000	0.000066	.....
54,000	0.000170	.....
350,000	0.001333	Evidences of scaling on outside surface.
400,000	0.001711	More pronounced scaling
425,000	0.002380	.....
430,000	0.004910	Instruments removed.
519,000	.....	Maximum load.
490,000	.....	Test discontinued; column had deflected about ¼-in. toward west.

The remainder of the column was used as reinforcement for a concrete column which was tested at the same time. It was octagonal in section, 18 in. short diameter; 22 ft. long, and weighed 6,100 lbs. The concrete consisted of 1 part Portland cement to 3 parts sand and was 43 days old when tested. The Phoenix column was continuous throughout the length of the reinforced column, but it was not centrally placed at one end. Fig. 2 gives the dimensions of the column before test with reference to its position in the testing machine. A light spiral reinforcement was also used. The spiral was of No. 6 steel wire, about 15½ in. in diameter; pitch about 2 in. The pitch and diameter of this spiral were very irregular in places. The column was fairly true to dimensions and nearly straight. The ends were well squared, the longitudinal reinforcement being flush with the ends of the column, which was loaded in a vertical position in a 600,000-lb. testing machine. The ends were bedded in a thin layer of plaster of paris in order to insure a uniform distribution of the load over the ends of the column. The plaster was allowed to harden in place for 28 hours before applying the load.

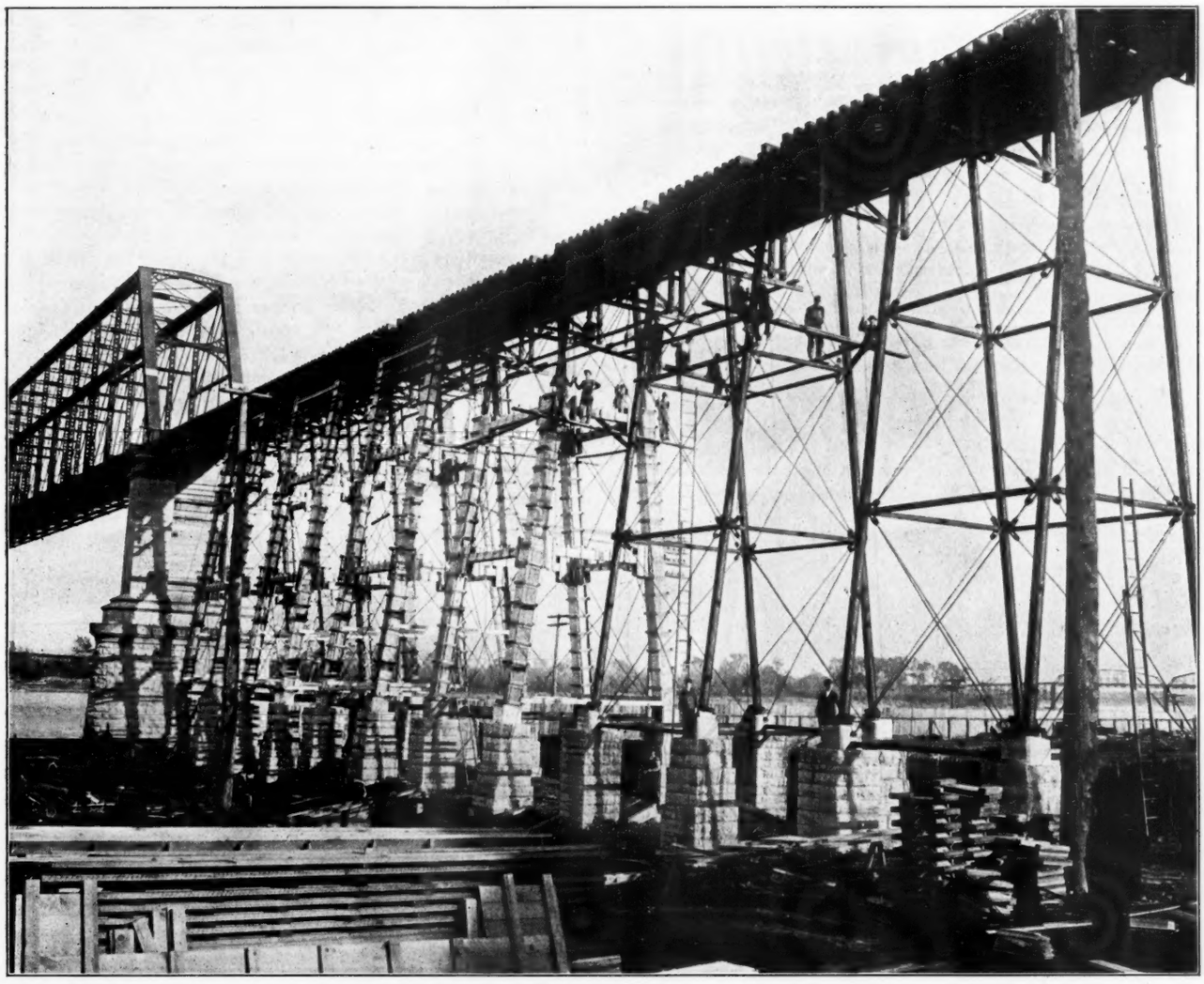


Fig. 4—Columns Being Encased in Concrete.

In order to obtain more definite information regarding the action of the column under load, measurements were taken to determine the longitudinal shortening of the column and the deviation from its original vertical position. The longitudinal shortening was measured by means of four extensometers, placed in sets of two on four faces of the column. These instruments were arranged in pairs, so that two independent sets of values were obtained. They could be read to 0.0001 in. The deviation of the column from its original vertical position was measured by means of fine threads stretched between points fixed near the ends of two faces of the column, 90 deg. apart. The movement of the threads over scales attached to the middle of the length of the column could be read to 0.01 in.

The load was applied through an adjustable bearing block. The pulling head of the testing machine moved at a rate of 0.05

in. per minute, and the load was applied in increments of about 25,000 lbs. At each increment of load the machine was stopped and a reading of the instruments taken. The load-deformation diagram for the column test is given in Fig. 3, and some of the notes are given in Table 2.

Table 2.

Total applied load, lbs.	Average unit shortening.	Deflection from vertical, in.	Remarks.
5,000	0.0	0.0	Initial load.
31,500	0.000016	....	.....
357,000	0.000507	0.01	First appreciable deflection.
395,000	0.000593	0.01	.....
426,000	0.000693	0.01	.....
461,000	0.000817	0.02	Slight spalling near bottom on east face.
495,000	0.000918	0.02	Fine vertical crack at bottom on east face about 11 in. high.
527,000	0.001026	0.02	Vertical cracks on nearly every face at bottom. Cracks in middle of north face, about 15 in. high. No sign of cracking or spalling at top.
554,000	0.001149	0.03	Spalling increasing near bottom.
580,000	0.001431	0.07	.....
590,000	.....	0.10	Spalling inside gage length on several corners.
594,000	.....	0.1	Maximum load.
587,000	.....	0.20	.....
577,000	.....	0.6	.....
560,000	.....	....	Test discontinued; column bent about 8 in. from vertical toward southeast face, at point 6 ft. from bottom. Sketch in Fig. 1 shows deviation of column from vertical after test. The photographs also show the condition after failure.

The failure of the column showed the effect of the eccentricity in the position of the reinforcing iron column. This gave the effect of a slight eccentricity to the load on the whole column. The first sign of distress was found at the bottom on the east face at a load of 461,000 lbs. The subsequent behavior of the column also indicated that the eccentricity of the reinforcing column was responsible for the early appearance of deflection from the vertical and the final excessive deflection toward the S. E. face as shown in Fig. 2. Failure seems to have been primarily due to this bending.

The concrete in the column was of a very poor quality and seemed to contain lime. Large pieces could be broken in the hands. As soon as the vertical cracks began to appear, large blocks of concrete became detached from the column and dropped. These blocks comprised the material outside the light spiral, which seemed very effective in restraining the concrete inside of it.

After the foregoing laboratory tests were made 4 columns in one bent were made into reinforced concrete columns and observed for one year, to see whether any effect was produced by the jarring and vibration due to traffic. No effect was noticed.

The tests having shown that the effect of using concrete in connection with the columns to convert the old Phoenix column into a reinforced concrete column was practically to double the strength, it was decided to convert the old wrought iron trestle approaches to the Danville, Ill., bridge and the St. Charles bridge to reinforced concrete trestle approaches, thus making them strong enough to carry any loads that are likely to be used now or in the future on this line, and also preserving the metal for an indefinite period. A very important feature of reinforced concrete columns is that they always afford occular evidence of their increasing weakness before they completely fail. The work on these two bridges is similar in appearance and detail, but the octagonal columns on the Danville bridge are 24 in. in

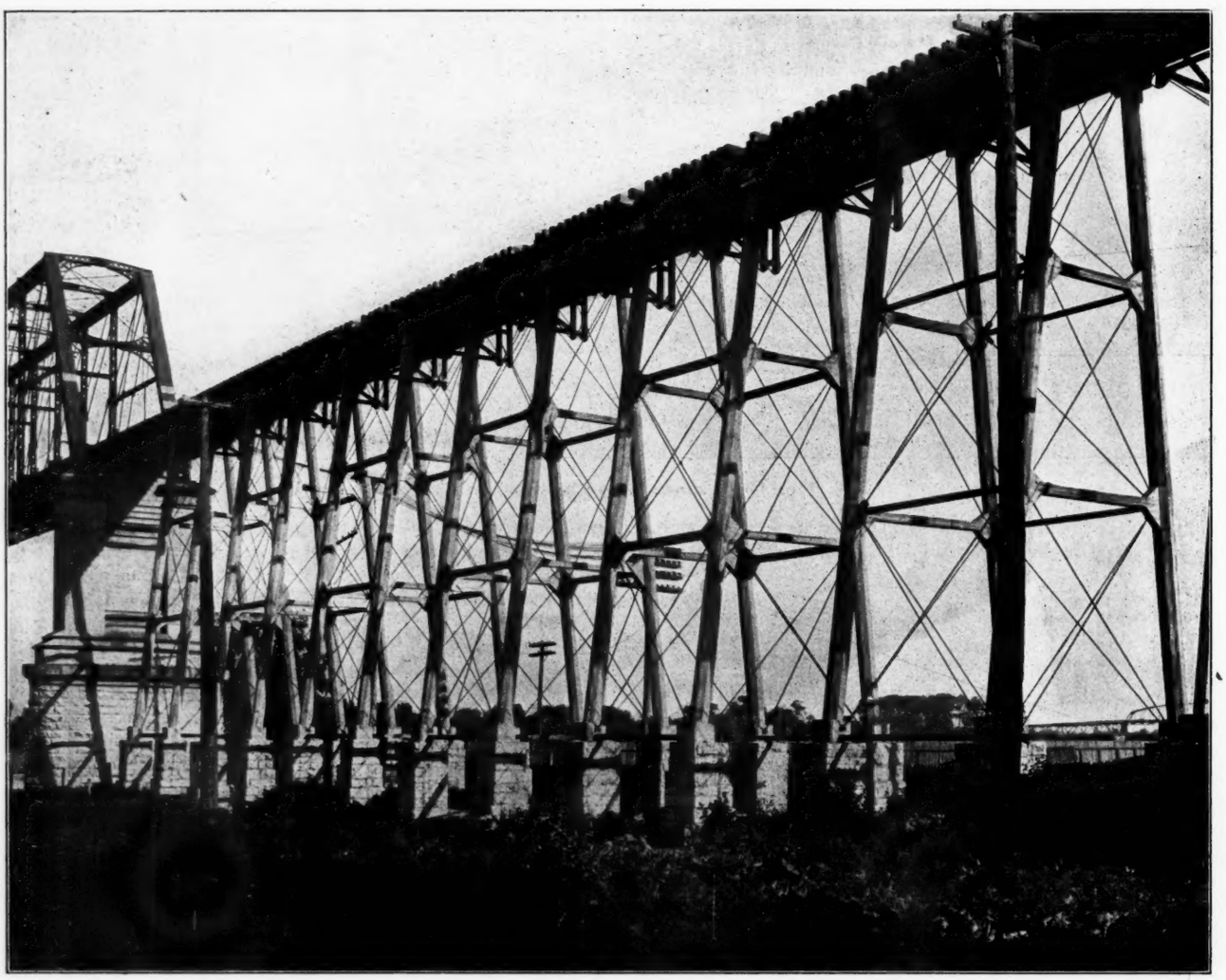


Fig. 5—Concrete Encasement Completed.

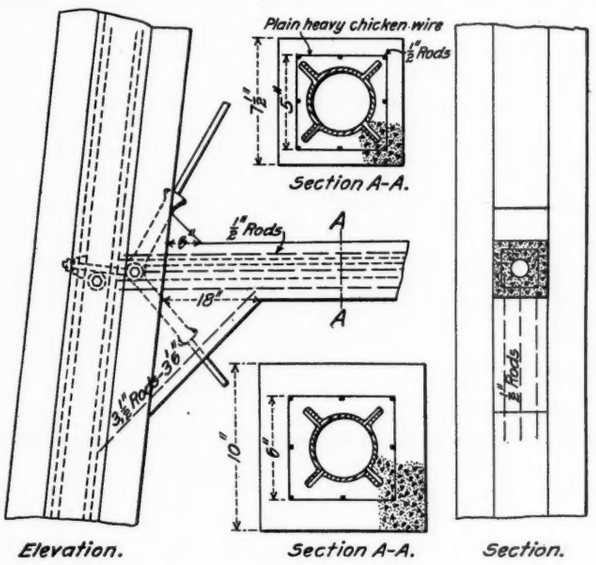


Fig. 7—Encasing Struts.

the short diameter, while on the St. Charles bridge they are 18 in. The east approach of the St. Charles bridge is 2,896 ft. long, and the west approach is 1,446 ft. long.

In Fig. 4 is shown the west approach of the St. Charles Bridge, where the columns are 40 ft. long, while the work was in progress. Fig. 5 shows the present appearance of the trestle. Concrete was poured from a car containing a concrete mixer and bins for sand and cement. One tower bent was completed at a time.

The concrete used is composed of 1 part of cement and 3 parts of coarse screened torpedo sand and fine gravel. The force of men engaged varied from 12 to 30, a fair average being about 20 men constantly employed. One tower (4 cols.) could be wrapped with the wire helix, have the forms put in place, concrete poured and the forms removed in about four days. Traffic over the trestle was not stopped during the progress of the work, and the concrete appeared to be excellent. It was stated in the report made by the testing laboratory that the concrete in the test specimen was rather poor, which was due to the fact that this particular column was made by laborers not accustomed to making concrete.

The concrete in the work itself is far superior, because it is made and placed by skilled workers in concrete. The work was done by the Carmichael Company, St. Louis, Mo. The plans were prepared and the work done under the supervision of A. O. Cunningham, chief engineer of the Wabash, to whom we are indebted for the information and illustrations from which this description was prepared.

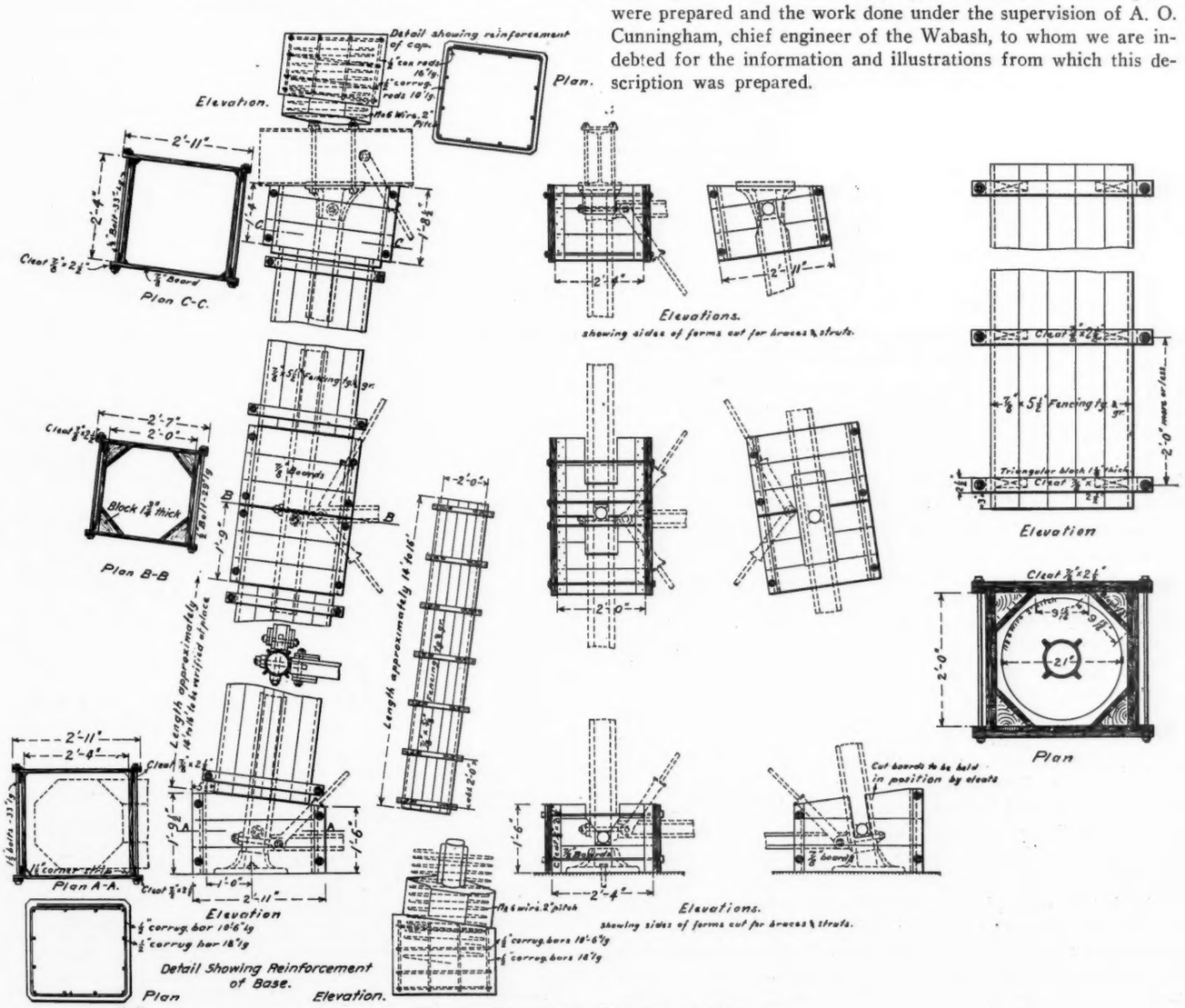


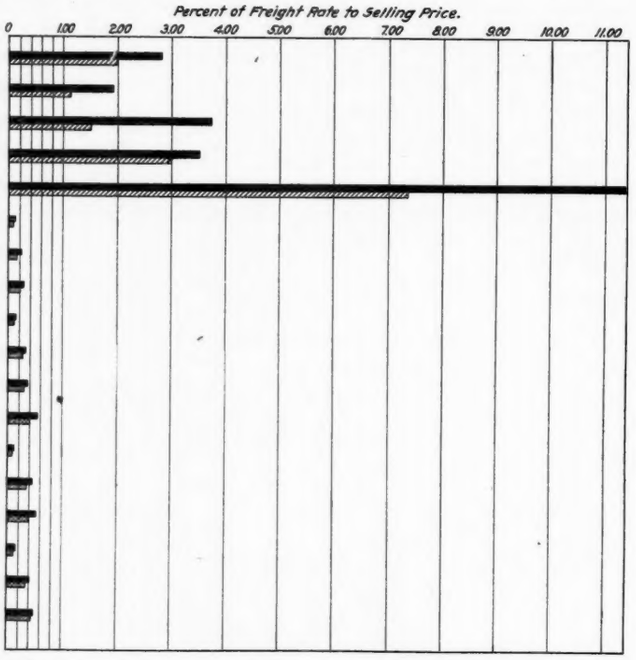
Fig. 8—Forms for Encasing Columns.

Area of section	3.318 *sq. in.*		0.1123 *cu. yds. concrete per lin. ft. outside of column.*
Area of steel column	0.083 *sq. in.*		0.0074 *cu. yds. concrete per lin. ft. inside of column.*
	3.230 *sq. in.*	*Total*	0.1197 *cu. yds. concrete per lin. ft.*

WAGES, PRICES AND FREIGHT RATES.

Some very interesting data regarding relative wages, commodity prices and freight rates has been collected by Julius Kruttschnitt, director of maintenance and operation of the Harriman lines, which is presented in graphic form in the accompanying illustrations. One of the most interesting features of the chart, entitled "Retail Selling Prices of Commodities and Railway Freight Rates in 1910 Compared With 1900," is the column headed "Percentage Freight Rate to Selling Price." It shows two things: first, that the percentage of the freight rate to the selling price of each commodity in 1900, as in 1910, was very small; and, second, that in every case it was smaller in 1910 than it was in 1900. The percentage of the freight rate to the selling price of each commodity is in each case smaller now than in 1900 because in every case the selling price of the commodity has increased, while in most cases the freight rate has remained stationary, and in some cases has declined.

Commodity.	Shipped from	Year.	Retail selling price.	Freight rate, cts.	Pr ct. freight rate to selling price.
Dressed beef, per lb.	Chicago to New York...	1900	16.0c.	.45	2.81
		1910	22.5c.	.45	2.00
Ham & bacon, per lb..	Chicago to New York...	1900	15.5c.	.30	1.94
		1910	26.5c.	.30	1.13
Lard, per lb.....	Chicago to New York...	1900	8.0c.	.30	3.75
		1910	20.0c.	.30	1.50
Eggs, per dozen.....	Iowa to New York.....	1900	43.0c.	1.50	3.49
		1910	50.0c.	1.50	3.00
Flour, per 50 lbs.....	Minneapolis–New York..	1900	$1.30	14.80	11.38
		1910	1.70	12.50	7.35
Men's suits, each....	Boston to New York....	1900	$18.00	1.9	.106
		1910	23.50	1.9	.081
Men's suits, each....	Boston to Chicago.....	1900	$18.00	4.2	.233
		1910	23.50	5.0	.213
Men's suits, each....	Boston to St. Louis.....	1900	$18.00	5.0	.278
		1910	23.50	4.2	.179
Women's suits, each.	Boston to New York	1900	$17.50	2.5	.143
		1910	22.50	2.5	.111
Women's suits, each.	Boston to Chicago.....	1900	$17.50	5.6	.320
		1910	22.50	5.6	.249
Women's suits, each.	Boston to St. Louis.....	1900	$17.50	6.6	.377
		1910	22.50	6.6	.293
Gloves, per pair.....	Gloversville–New York..	1900	$1.00	0.55	.550
		1910	1.37	0.55	.401
Underwear, per suit.	Boston to New York....	1900	$1.50	0.15	.100
		1910	2.00	0.15	.075
Underwear, per suit.	Boston to Chicago.....	1900	$1.50	0.7	.467
		1910	2.00	0.7	.350
Underwear, per suit.	Boston to St. Louis.....	1900	$1.50	0.8	.533
		1910	2.00	0.8	.400
Shoes, per pair.....	Boston to New York...	1900	$3.50	0.5	.143
		1910	4.00	0.5	.125
Shoes, per pair.....	Boston to Chicago.....	1900	$3.50	1.4	.400
		1910	4.00	1.4	.350
Shoes, per pair.....	Boston to St. Louis.....	1900	$3.50	1.66	.474
		1910	4.00	1.66	.415

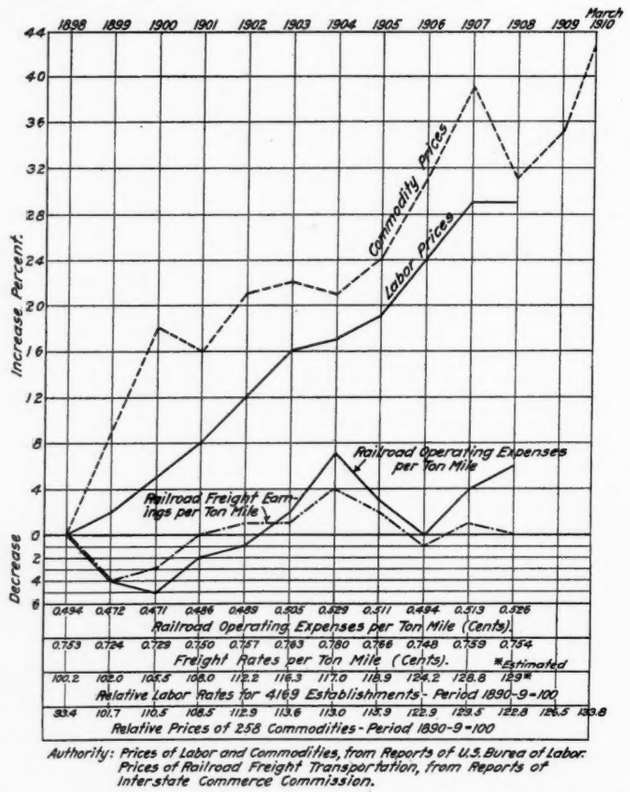


Retail Selling Prices of Commodities and Railway Freight Rates in 1910 Compared with 1900.

For example, take the case of flour, the percentage of the freight rate to the selling price of which is larger than to any other commodity mentioned. In 1900 the freight rate was 11.38 per cent. of the selling price of the commodity. In 1910 it is 7.35 per cent. of the selling price of the commodity. This is due to the fact that the rate on flour per 50 pounds from Minneapolis to New York declined from 14.8 cents in 1900 to 12.5 cents in 1910, while the price of flour per 50 pounds increased from $1.30 to $1.70. The figures show how negligible the freight rate generally is as compared with the retail selling price of the commodity. For example, in 1900 the freight rate on dressed beef from Chicago to New York was 2.8 per cent. of the retail price at which it was sold in New York, and in 1910 it was but 2 per cent. In 1910 the average freight rate per suit on underwear from Boston to New York was but 0.1 per cent. of its retail selling price in New York, and in 1910 it was 0.075 per cent.

The freight rates given were verified by references to tariffs in effect in 1900 and to similar tariffs in effect in 1910. The prices were ascertained by inquiry from the leading retail dealers in the various commodities in New York, Chicago and St. Louis. In all cases the investigation was made to find for the two periods the prices for exactly the same quality of commodity. In the case of clothing, quotations were obtained for various grades in the two years mentioned, an average being computed from all the quotations received where the prices quoted were for exactly the same quality of goods.

The second chart is, no doubt, self-explanatory. No figures showing freight rates per ton per mile and railway operating expenses per ton per mile are given for any date later than 1908, because, when the charts were made no statistics of the Interstate Commerce Commission for any later date were available. The statistics of the commission show that the average rate per ton per mile in the year ended June 30, 1909, was 7.63 per cent., which is the same as it was in 1903.


1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 March 1910
Increase Percent.
Decrease
Commodity prices
Labor Prices
Railroad Operating Expenses per Ton Mile
Railroad Freight Earnings per Ton Mile
0.494 0.472 0.471 0.486 0.489 0.505 0.529 0.511 0.494 0.513 0.526
Railroad Operating Expenses per Ton Mile (Cents).
0.753 0.724 0.729 0.750 0.757 0.763 0.780 0.766 0.748 0.739 0.754
Freight Rates per Ton Mile (Cents). *Estimated
100.2 102.0 105.5 108.0 112.2 116.3 117.0 118.9 124.2 128.8 129*
Relative Labor Rates for 416 Establishments - Period 1890-9=100
93.4 101.7 110.5 108.5 112.9 113.6 113.0 113.9 122.9 129.5 122.8 126.5 133.8
Relative Prices of 258 Commodities - Period 1890-9=100

Authority: Prices of Labor and Commodities, from Reports of U.S. Bureau of Labor. Prices of Railroad Freight Transportation, from Reports of Interstate Commerce Commission.

Labor and Commodity Prices, Freight Rates and Expenses per Ton Mile.

THE CAR DEMURRAGE BUREAUS.

BY WILLIAM BENDER WILSON.

After twenty years of their existence, during which they proved their efficiency, it is not necessary to dwell at any length upon the advantages derived by the railways from the Car Demurrage Bureaus. The reasons for their existence, more patent to-day than when they were first formed, are so manifest that no room is left for any sound argument for their discontinuance. They have insured accuracy to the individual road at a minimum of cost, assured to it uniform procedure, and, being disinterested parties have through judicious action prevented misunderstandings and friction between competing lines.

Prior to the formation of Car Service Associations and their successors, the Car Demurrage Bureaus, the detention to cars and the consequent loss of their earning power was enormous. At that time, by reason of the fact that there was no neutral force to prove, probe and unveil false statements, consignors and consignees placed one competitive road against another, causing constant friction between roads and serious delays to cars; and the collection of demurrage charges was farcical. When collections were made they were made erratically and generally to be refunded to the party paying them; if not by the operating departments they would be refunded by the traffic departments. The formation of the associations or bureaus worked a complete revolution in the practice of the public holding cars at will for loading and unloading purposes, reduced delays to cars, brought competing lines into harmony by the removal of suspicion, saved millions of dollars in the purchase of cars and of land for the laying of tracks necessary to hold cars, and added millions of dollars to the revenues of the roads above and beyond the cost of maintaining the bureaus.

In view of these facts, it is scarcely conceivable that the abandonment of such a valuable asset as these bureaus have proved themselves to be, should be considered by any responsible railway officer. However, there is an agitation going on, the objective being the accomplishing of such result. The reasons advanced are varied and may be summarized as follows:

First: The filing of demurrage rules with the Interstate Commerce and State Railroad Commissions by each railway separately renders the bureaus unnecessary. The assumption contained in this reason is that the supervision of these commissions will bring about through the majesty of the law a millenium in the commercial dealings of the public with the railways, which event would cause the elmination of frauds, either direct or indirect, or through collusion, on the revenues of the latter and produce a happy uniformity and strict accuracy in the interpretation, application and enforcement of car demurrage rules and act as a deterrent to sidestepping by competitors. The fallacy of this assumption is to be found in the well-established fact that reverence for the majesty of the law or fear of the law's penalties has not prevented evasions or violations of the law in the past, and does not in the present; and the time in the future when they will is very remote. It is, therefore, reasonable to assume that a disinterested bureau of supervision and arbitration, such as the car demurrage bureaus are, with its care and watchfulness in the direction of prevention will tend to lessen the probability of evasion or violation. In this connection it is educational to recall that falsification of weight and in classification, in violation of criminal statutes, has been practiced ever since there has been a railway. However, crimes of that character against the railway have been lessening year by year through the constant watchfulness and care of the inspection bureaus of the traffic departments: results not found feasible by independent action by individual roads. Classification rules, like demurrage rules, are filed with the Interstate Commerce Commission. Does that fact suggest that it would be a wise policy to abolish those bureaus and again open the door to a wide assault upon railway revenues? Also, as most of the subjects dealt with by the American Railway Association and the various traffic associations, are amenable to state and national laws, would that be considered a good reason why those associations should be abolished and the subjects relegated to the individual roads for independent consideration?

Second: Independent administration of our demurrage rules will permit combined reports.

The value of combined reports is yet to be demonstrated, but as the question is merely one of economic detail, it could be worked out just as well and as economically under a bureau as under any other sub-division of railway administration, with an advantage in favor of the bureau. The latter would give a common and equal attention to all roads in the preparation and forwarding of such reports and in dealing with them would be an influential factor in producing uniformity and accuracy in them.

Third: Sidestepping of the bureau in the matter of collecting our demurrage charges.

The car demurrage bureaus were never charged with a duty of collecting revenues, but they have been influential in aiding railway agents in collecting outstanding demurrage charges and the companies themselves in collecting such charges by legal process. It has always been the policy of railway corporations to make their revenue collections through their immediate bonded agents or by legal process, and the probability of changing that policy is very remote. Responsibility for the failure to collect revenues of any description must necessarily rest upon railway administration, as it cannot be placed upon bureaus whose exclusive field of activity is to hasten the loading and unloading of cars.

The foregoing reasons, together with the claims of greater economy in independent actions, are the principal arguments advanced for the substitution of road for joint bureaus. The arbitration feature of the joint bureaus is entirely ignored and yet that feature has proved itself to be a most valuable if not indispensable agency in dealing with disputes with the public and between roads, and it would be a decided step backward to dispense with it. As to economy, it is extremely doubtful if any could be effected or that any road could maintain a sufficient force of inspectors and clerks for the pro rata amount it now pays the joint bureaus for that service: on the contrary, there is a strong probability that the expense would increase, if not immediately, surely in a short time after the independent bureau was organized, for it is a well recognized fact that no matter how modest numerically the force may be on the inauguration of a new bureau on a railway, in an incredibly short time thereafter the cry for more assistance is raised and the force increases and continues to do so.

The tentative plan which has been suggested for the substitution of road for joint bureaus embraces in its main features the combination of "car record," "car orders," "car distribution," "car demurrage" and "per diem" into a bureau, and the formation of a joint committee of administration to be composed of representatives from each of the roads in the territory affected. As to the combination feature: The provisions for inspectors would overload such employees to such an extent that some of the subjects intrusted to their care would at times, perhaps very frequently, become subordinated to the other one or ones they considered more important. Car demurrage does not stand in a very close relation to the other subjects, for it deals directly with the commercial public, the closer to which the inspector can get the greater force is exercised in preventing the occurrence of demurrage. By this close relation to the public the inspectors of the joint bureaus have been very successful in preventing demurrage as well as reducing its accumulation and, because of their equal relationship to competing roads, without stirring up strife between the public and any one road. It is not probable that an inspector representing only one road could accomplish similar results, but there is a strong probability that if he were able to and did his full duty in the premises he would produce an opposite effect, to the detriment of the road employing him. Competing roads A, B and C, each employing their own inspectors in common territory, A's inspector looking only after the interests of his own road constantly prods the patron to release its cars, paying no

heed to the release of those of B and C, whose inspectors through design, neglect or multiplied duties are not so constant in prodding and the effect will be to incline the patron away from A and toward B and C. This suggested individual road inspection can be readily and easily manipulated to aid one road in obtaining business as against another road in competition and yet in such a manner as to preclude legal interference and to be beyond the sight of the competitor. It is dangerous. In the matter of reports, and checking spoken of in the plan there are not any advantages over the practices now existing or which could not be adopted under existing conditions.

The organization of a joint committee for oversight of car detention and demurrage charges in a competitive territory to rest upon courtesy is too Utopian to be practicable. The idea of an offending road laying bare its records to a competing and complaining road and submitting itself to the judgment of its accuser is too celestial to permit of its practical application on earth. The proposition is too humorous to be seriously considered.

In regulating car detention, with competing lines in evidence, a neutral force, such as the Car Demurrage Bureaus provide, is necessary for the fair, equitable and just administration of car demurrage rules, which cannot be given by a number of detached independent road bureaus.

CONVERTED AUTOMOBILE MOTOR CAR.

The motor car shown in the photograph was put together by W. B. Chenoweth, round-house foreman of the Atchison, Topeka & Santa Fe at Longview, Tex., who gives the following details:

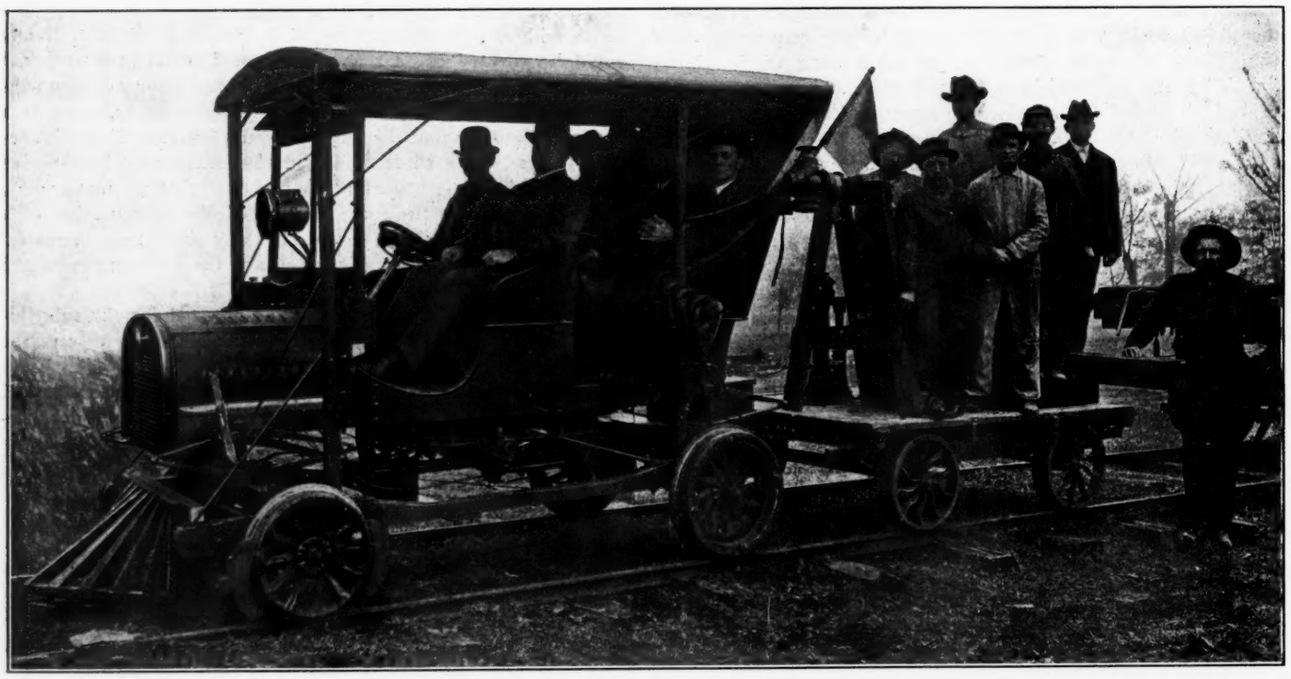
The car was originally a Rambler automobile, two-cylinder, 24-h.p. We purchased the car second hand for $250. The car is of the 1907 model; it had run over two years as an automobile, and in purchasing the car we produced great joy in the camp of the automobile dealer, for it was supposed to be worn out, but it wasn't.

As a motor car it has 24-in. steel tired wheels on the rear or driving axle and 20-in. steel wheels in front. The wheels are pressed on both axles. The rear axle is solid steel, as a differential is not necessary on a railway track. The engine has a 13-tooth sprocket on shaft, and the rear axle has a 24-tooth sprocket; hence it is geared to less than 2 to 1 on high gear, and we have no use for the low gear on a track. In fact, the low gear band has been removed from the transmission drum. The rear wheels make 835 revolutions per mile, and being geared 13 to 24 the engine makes 1,540 revolutions per mile. As the engine will make 1,500 revolutions per minute the speed is very evident on the face of the returns; at any rate, it is what the farmers term "tolerably fast."

As a private enterprise used as a public utility its value can not properly be estimated. We can haul 18 men and 150 ties in case of washouts or accidents. As an illustration, in July we had a passenger train derailment 47 miles from Longview; we loaded four men and four Norton 35-ton jacks and were at the scene of the wreck in one hour and fifty minutes. Again, the arch bars broke on an engine tank 36 miles from Longview. This blocked the main line, as the wheels spread when the bars broke. We loaded a set of arch bars, four men, two Norton jacks and were on the ground in one hour. Again, if we see that a train and crew is going to get caught between terminals by the sixteen-hour law we can take an engine and train crew and relieve them in short order. We, therefore, have no traffic delays from this cause.

On August 19 conditions required that our vice-president and superintendent see every employee on the line in person. Our line consists of 98 miles of track. We left Longview at 10:30 a.m., saw every employee on the line and were back in Longview at 9:00 p.m. same date. To have done this by train service would have taken four days. This is a saving of three days' time and $10 hotel bills.

A short time ago one of our pumps broke at a water station 45 miles south of Longview, which caught a train at this station without water. They could not run for water because of lack of water to go on. We arrived at the station with repairs for the pump in 1 hour and 25 minutes, with delay to the train of only two hours and thirty minutes.



Motor Car and Trailer.

The car was put in service on February 12, 1910, and has made 6,000 miles without a delay on the road for repairs. It is equipped with the Apple system of ignition. This consists of Apple dynamo run through eight dry cells to the spark coil, with two of the cells dead; this is to temper the current in case of high voltage, as the dynamo has no governor. The car has run seven months with the same dry cells and the cells are

to-day apparently as hot as they ever were. The car uses four gallons of gasolene and one pint of lubricating oil per 100 miles; this makes 25 miles per gallon of gasolene, or a cost of approximately one cent per mile. This is for the car loaded without the trailers; with the trailers it will make 18 miles per gallon of gasolene.

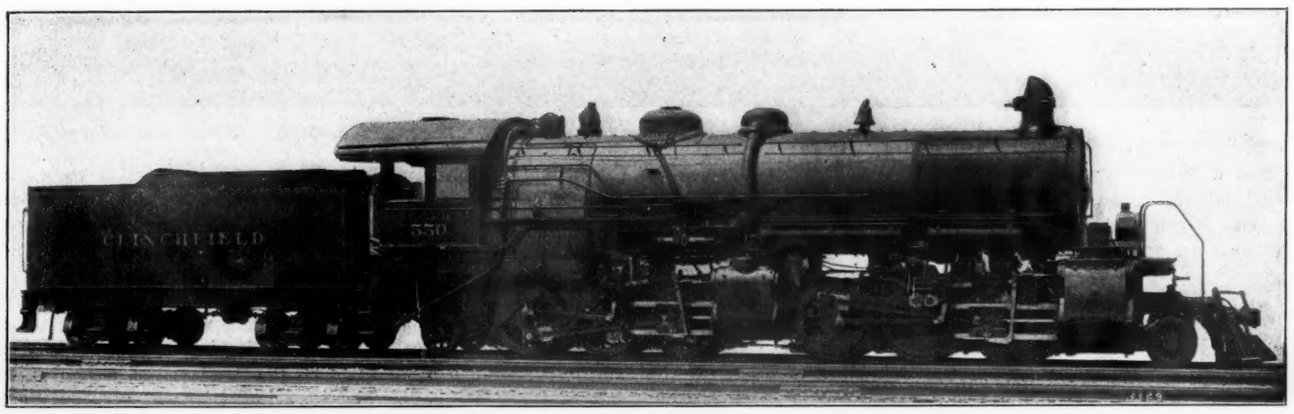
The car is operated by train order strictly; it is not allowed to go on the main line without first getting orders from the dispatcher's office.

The cost to convert this car into a motor car was as follows: Labor, $36.20; material, $29.60; Apple dynamo, spark coil and headlight, $37.50; cost of automobile, $250.

The brakes are operated by the exhaust from the engine; this is done by a cut-out which connects to the 8-in. brake cylinder. The exhaust is cut into this brake cylinder and the pressure is held in the cylinder by a 1-in. check valve. It is possible to put 50 lbs. pressure into the brake cylinder. The brake cylinder pressure is released by an independent lever. When the brakes are applied it also cuts the engine speed down on account of back pressure. This is an advantage on a motor car, as it keeps the engine from racing when the clutch is thrown out and brakes applied.

MALLET AND PACIFIC TYPE LOCOMOTIVES; CAROLINA, CLINCHFIELD & OHIO.

The Carolina, Clinchfield & Ohio runs almost directly south from Elkhorn City, Ky., to Spartanburg, S. C., and is used largely for transporting coal. It presents a maximum grade against loaded traffic of only .5 per cent. and the sharpest curves on the main line are 8 deg. In 1909 the road received an experimental Mallet locomotive, 2-6-6-2 type, from the Baldwin Locomotive Works. It weighed 342,000 lbs., of which 300,000 lbs. were on the driving wheels, and was rated at 4,000 tons. Its performance has proved so satisfactory that ten more locomotives of a similar type, but of greater capacity, have been ordered from the same builders; also three Pacific type locomotives for passenger service.



Mallet Locomotive for the Carolina, Clinchfield & Ohio.

MALLET LOCOMOTIVES.

The new locomotives weigh 378,650 lbs., with 325,850 lbs on the drivers, and have a tractive effort of 77,500 lbs. The boiler does not have a separable joint or feed water heater; the tubes are 21 ft. long. The shell, which is unusually large, is 86 in. in diameter. The exhaust from the high-pressure cylinders passes through a Baldwin reheater in the smokebox. The ratios indicate a free steaming engine with the good grade of coal which is used. Radial stays are used for the firebox and 404 flexible stays are grouped in the outside rows on the sides and back, in the upper corners of the sides and in two triangular areas on eithter side in the throat. Two oval fire-doors are placed 44 in. apart, center to center.

The boiler barrel is composed of three rings, the dome being placed on the second ring immediately above the high-pressure cylinders. The arrangement of the steam piping is similar to that used on the Mallet locomotives built for the Southern Pacific Company (*Railway Age Gazette,* April 30, 1909, page 933). The steam distribution is controlled throughout by 15-in. piston valves, all of the same design. The high-pressure valves provide inside admission and the low-pressure outside admission, the ports and bushings being modified to suit. The valves are all set with a lead of ¼ in., a steam lap of 1⅛ in., and an exhaust clearance of ¼ in. The by-pass valves consist of flat plates, which normally cover the relief ports; this arrangement being in accordance with the usual practice of the builders for piston valve locomotives. Walschaert valve motion is used throughout, and the gears are controlled simultaneously by the Baldwin power reverse mechanism.

The frames are of cast steel, 5 in. in width, and the articulated connection is effected by a single radius bar. The boiler is supported on the front frames by a single bearer placed between the second and third pairs of driving wheels. The front bearer carries the controlling springs, and normally has a clearance of ½ in. between the upper and lower castings.

PACIFIC LOCOMOTIVES.

These locomotives have a tractive effort of 37,000 lbs. and, as indicated by the ratios, are well adapted for handling heavy trains on long grades. The boiler is of the extended wagon top type, 74 in. in diameter at the front ring and 83½ in. on the wagon top. The firebox staying is similar to that of the Mallet locomotives, the flexible stays numbering 386. The fire-doors are two in number, and are placed 28 in. between centers, the width of the grate being 71¾ in. The tubes are set with ⅞-in. bridges.

The stack is of cast iron, with a wide-mouthed internal extension, and measures 21½ in. in diameter at the choke. The Master Mechanics' style of front end is used with an adjustable diaphragm plate in front of the nozzle. No cinder pocket is provided with this arrangement.

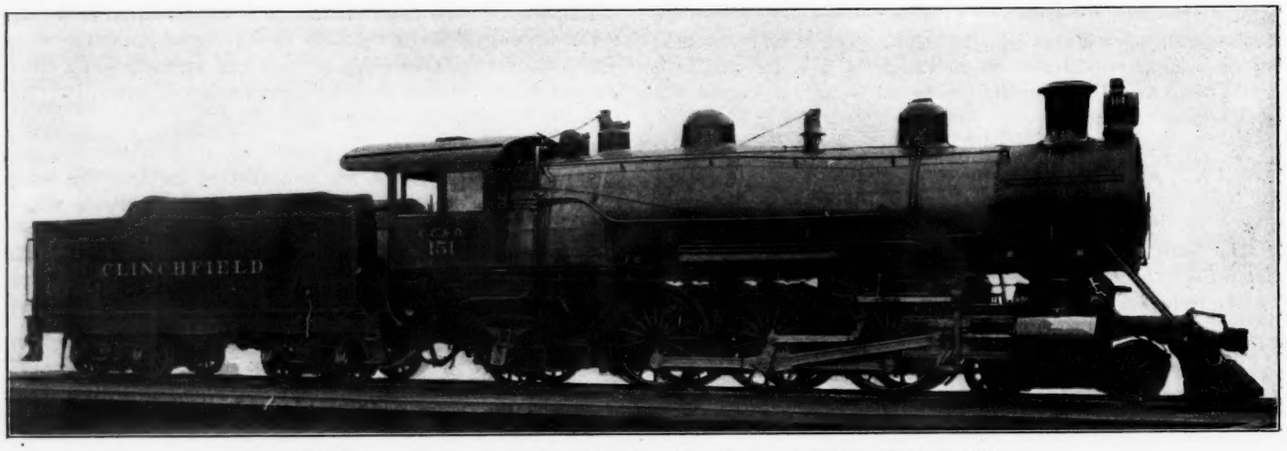
The main frames are of cast steel, 5 in. in width, and in one piece with the rear sections. The front rails are single and of wrought iron. Each rail is hooked and double keyed to its corresponding main frame, and is held in place by four vertical bolts, 1½ in. in diameter. At the point of its connection with the cylinder saddle the frame measures 4½ in. wide by 7 in. deep.

The front truck is of the swing bolster type and is fitted with a cast steel saddle and three-point suspension swing links of the same material. The wheels are steel tired with cast iron centers. The rear truck is of the radial type with outside journals. The side swing is taken by the spring links, which are seated at each end on flat keys, and so arranged that they have a limited amount of fore and aft, as well as transverse, swing.

The cylinders are lined with bushings ⅝ in. thick, and are placed 87 in. between centers, while the steam chest centers

are 49 in. apart. The valves are duplicates of those used on the Mallet locomotives and are arranged for inside admission, and set with a lead of ¼ in. The by-pass valves are also similar to those of the Mallet locomotives. The location of the steam chests on the Pacific type engines simplifies the arrangement of the steam and exhaust passages, but necessitates using rockers in connection with the Walschaert valve gear. The rocker boxes are bolted to the guide yoke, and the links are carried on longitudinal bearers outside the leading driving wheels.

The tenders of both classes of locomotives are similar in construction, although those for the freight engines have a greater fuel and water capacity. The frames are constructed of 12-in. channels, the center sills weighing 40 lbs. per foot and the side sills 25 lbs. The tanks are of the water-bottom type. Arch bar trucks are used, those under the passenger tenders being fitted with steel-tired wheels, while the freight tenders are carried on solid rolled steel wheels.



Pacific Type Passenger Locomotive for the Carolina, Clinchfield & Ohio.

The principal dimensions and ratios of both classes of locomotives are as follows:

General Data.		
Type	2-6-6-2	4-6-2
Fuel	Bit. coal	Bit. coal
Tractive effort	77,500* lbs.	37,000 lbs.
Weight in working order	378,650 "	233,050 "
Weight on drivers	325,850 "	152,900 "
Weight on leading truck	24,600 "	42,750 "
Weight on trailing truck	28,200 "	37,400 "
Weight of engine and tender in working order	550,000 "	385,000 "
Wheel base, driving	31 ft.	13 ft.
Wheel base, total	46 ft. 6 in.	34 ft.
Wheel base, engine and tender	74 ft. 11 in.	65 ft. 10 in.
Ratios.		
Total weight ÷ tractive effort	4.88	6.30
Weight on drivers ÷ tractive effort	4.22	4.13
Tractive effort x diam. drivers ÷ heating surface	767.00	625.00
Total heating surface ÷ grate area	73.80	75.80
Firebox heating surface ÷ total heating surface, %	4.00	4.70
Weight on drivers ÷ total heating surface	56.80	37.40
Total weight ÷ total heating surface	65.80	57.00
Volume equiv. simple cylinders, cu. ft.	23.70	14.40
Total heating surface ÷ vol. cylinders	242.30	283.00
Grate area ÷ vol. cylinders	3.29	3.74
Cylinders.		
Kind	Compound	Simple
Diameter	24 and 37 in.	23 in.
Stroke	32 in.	30 in.
Valves.		
Kind	Piston	Piston
Diameter	15 in.	15 in.
Outside lap	1⅛ "	
Inside clearance	¼ "	
Lead	¼ "	¼ in.
Wheels.		
Driving, diameter over tires	57 in.	69 in.
Driving, thickness of tire	3½ "	3½ "
Driving journals, main, diameter and length	11 x 13 "	10 x 13 "
Driving journals, others, diameter and length	10 x 13 "	9 x 13 "
Engine truck wheels, diameter	33 "	33 "
Engine truck, journals	6½ x 12 "	6½ x 12 "
Trailing truck wheels, diameter	33 "	45 "
Trailing truck, journals	6½ x 12 "	8 x 14 "
Boiler.		
Style	Straight	W. T.
Working pressure	200 lbs.	190 lbs.
Outside diameter of first ring	86 in.	74 in.
Firebox, length and width	117 x 96 "	108⅛ x 71¾ "
Firebox plate, thickness	¾ and ½ "	¾-⅝-½ "
Firebox, water space	F 6, S. & B. 5 "	F. 5, S. & B. 4 in.
Tubes, number and outside diameter	448—2¼ "	317—2¼ "
Tubes, length	21 ft.	21 ft.
Heating surface, tubes	5,519 sq. ft.	3,903 sq. ft.
Heating surface, firebox	233 " "	192 " "
Heating surface, total	5,752 " "	4,095 " "
Grate area	78 " "	54 " "
Center of boiler above rail	122 in.	112 in.
Tender.		
Tank	Water bottom	Water bottom
Frame	12 in. chan.	12 in. chan.
Wheels, diameter	33 in.	36 in.
Journals, diameter and length	6 x 11 in.	5½ x 10 in.
Water capacity	10,000 gals.	8,000 gals.
Coal capacity	15 tons	14 tons.

* $\frac{1.2\ P\ d^2\ s}{D} = T.E.$

d = Diam. H.P. cylinder.

THE CHINCHOW-AIGUN RAILWAY.

The importance of Newchwang, China, as a commercial port should be further enhanced by the construction of the proposed railway from Chinchow to Aigun, writes the British Consul, for, though the intention of the Chinese Government is to make Hulutao, a natural and ice-free harbor on the coast 35 miles southwest of Chinchow, the sea terminus of the line, Newchwang will obtain a considerable portion of the trade which the line should soon develop. The proposed line is intended to develop the Mongolian districts lying west of the Japanese and Russian railways, in Manchuria as far as Tsitsihar, where it meets the Trans-Siberian Railway. Thence the line is to be continued due north to Aigun, a small town on the Amur river, a few miles east of Blagoveschensk. There are indications of very excellent coal within 100 miles of the starting point of the line at Chinchow.

A 60 years' concession has been granted to Colonel José Guilherme, of Souza, Brazil, and Dr. Vicente de Toledo, of Ouro Preto, for the construction and operation of a railway from Porto do Souza, in the state of Espirito Santo, to Manhuassú, in the state of Minas Geraes. The concession includes a subsidy of about $2,300 per mile. Any material to be imported for the building of the line will be exempt from customs duty. The estimate of about $1,250,000 for the construction of a section, 34 miles long, of the Goyaz railway from Araguary to Catalao have been approved. A credit of $78,500 has been opened at the Ministerio da Viaçao a Obras Publicas, to meet the expenses for the construction of the railway running from Cruz Alta to the mouth of the River Ijuhy.

The Belgian State Railways have had 26 different ministers since their beginning in 1836. Then they were under the Minister of the Interior, but shortly afterward the newly created Ministry of Public Works took them over, and in 1884 the Ministry of Railways was established, since which time the occupant has been more stable, Vanderpeerebohm holding the place from 1884 to 1899, Libaert from 1899 to 1907, when he was succeeded by the present minister, Helleputte, who was graduated as an engineer in Ghent in 1872, served for three years on the railways, became a professor of architecture and engineering, a member of parliament in 1889, and Railway Minister in 1907.

General News Section.

The Baltimore & Ohio Southwestern announces that it will withdraw, October 1, from the Cincinnati Demurrage Bureau.

Governor Campbell, of Texas, has signed the bill to compel whoever buys the International & Great Northern at foreclosure to pay unsecured claims against it.

The American Bar Association at its meeting in Chattanooga, Tenn., last week, adopted the report of a committee recommending for general adoption in all the states a Transfer of Stock law and a Bill of Lading law.

The Hine system of organization has been adopted in the general manager's office of the Southern Pacific lines in Oregon, as announced in another column. The arrangement is similar to that which was adopted on the Union Pacific last July. (July 8, p. 69.)

A press despatch from Houston, Tex., says that car repairers and other men, to the number of 1,000, including various classes which have to do with cars in the yards, employed on the Southern Pacific lines in Texas, have struck, demanding recognition of their union. According to one account, the strike has held up work in all of the shops between New Orleans and El Paso.

The office of the "Associated Railways" at Nashville, Tenn., which has been maintained by a number of the principal southern railways for several years past, with E. Baxter as counsel, to deal with interstate commerce matters, has been abandoned and after the first of October these matters will be looked after by a similar office to be maintained at Washington, with R. W. Moore as counsel.

Albany and Buffalo papers report a strike on the New York Central of the Brotherhood of Railway Signalmen, a union which seems to be made up of lampmen and batterymen and some of the mechanics. The leader of the strikers is J. A. Martin, who says that the strike is doing serious damage to the road; but the officers of the company say that not enough men have left their work to seriously disturb traffic.

Italy owns its telegraphs, and the government has announced reduced rates for telegrams; these go into effect December 1, superseding rates which have been in effect over 25 years. Ordinary telegrams of 10 words will cost 11½ cents, as compared with 19.3 cents at present; each additional word will be one cent; urgent telegrams 34.7 cents and three cents for each additional word above 10. Telegrams addressed to newspapers go at half price between 9 p.m. and 6 a.m.

The Hudson & Manhattan has opened its line to Henderson street, Jersey City, west of the Pennsylvania station, and has made a change in the arrangement of its trains. The running of trains from Cortlandt street, Manhattan, to New Jersey and back across the river by the Christopher street tunnel and thence northward to 23rd street has been discontinued. The trains through the Christopher street tunnel now run to and from Henderson street, Jersey City. From Henderson street trains are run also to and from Cortlandt street, New York.

On the London, Brighton & South Coast, between Horley and Three Bridges, England, Henry Von Kramer has telephoned to and from a moving train, without a mechanical connection. The arrangement is similar to that which has been used in this country (on the New York, New Haven & Hartford and the Lehigh Valley) for telegraphing to and from moving trains. Two wires were laid along the tracks between the stations named and the electrical conductors on the train were arranged so as to move along at a distance of about 18 in. from the wires.

At Inman, near Atlanta, the Southern Railway has just finished and opened a large freight transfer station, to be known as "Inman Transfer," the operation of which will result in saving 24 hours in the time required for the delivery of L.C.L. freight from the east and west to all points south and west of Atlanta and vice versa. There are four sheds, each 700 ft. long, with tracks running the full length on both sides. This will give space for 125 cars at one time, and the station has a daily capacity of several hundred cars. At present 125 men are employed on the platforms, and it is intended to add a night shift later.

On the night of September 1 at Divide, Colo., a robber who tried to get the valuables in the express car of train No. 3 of the Colorado Midland was instantly killed by the engineman of the train, Frank Stewart. The robber boarded the engine, while the train was at a lonely side track waiting for a train moving in the opposite direction, and he ordered the engineman and fireman to go back and aid him in getting into the express car. As they reached the car, the fireman dashed under it and crawled to the other side. The robber leaned down to shoot the fireman and the moment he turned his eyes away from the engineman. Stewart struck him on the head with a stone, which he had picked up as he got off the engine, and the robber was instantly killed.

Railway Exhibit at the Ohio Valley Exhibition.

The Ohio Valley Exhibition, which opened on August 24 and will continue until September 24, contains an exhibit which was provided by the combined railways of the South with the exception of some of the smaller roads and the Atlantic Coast Line. The various roads have contributed to the expenses in proportion to their mileage. T. C. Powell, vice-president of the Queen & Crescent Route, is chairman of the exposition's committee on the "South and Its Resources," and he has sent out a circular stating that the purpose of the railways in contributing this exhibition is to interest the people of the North in the South's resources in the expectation that this will promote the immigration of settlers from the North to the South and increase the number of industries in that section.

Criticism of Missouri Railroad Commission.

The charge that the Board of Railroad and Warehouse Commissioners of Missouri as now constituted is of little value to the state—useless, in fact—is borne out by the records of the office at Jefferson City. Dissension among the commissioners, who disagree on many of the complaints presented, adds to the inefficiency of the board. Reports of inspections of railway property on file in the office of the secretary of the board plainly show that at least one of the commissioners enjoys an almost perpetual vacation. This commissioner finds time to attend political meetings and conferences in the interest of a single Democratic candidate for a high office, but is frequently absent from board meetings and inspection trips. Two of the commissioners admit that they are handicapped by the discord engendered, they claimed, by the third member.

Neither Governor Hadley nor the attorney-general's office is pleased with the existing conditions, but the hands of officials who might correct matters are tied by the law, which appears to have invested the railway commissioners with a peculiar and almost royal sanctity. In justice to the commissioners, it should be stated that in some specific instances the powers of the board have been curtailed by injunction and court decisions, but there still remains to them sufficient power to keep them busy if the duties of their office were strictly attended to.

It would not be fair to leave the impression that all of the members of the board are negligent. Commissioner H. R. Oglesby invited *The Republic* to compare his record with that of his fellow board members, and it is only justice to state that the reports indicate that he has been the most active. For more than three years there has been a disagreement among the commissioners as to how inspections should be made, Mr. Knott refusing to accompany Messrs. Oglesby and Wightmann on special inspection trains provided by the railways for that purpose. In a few cases Commissioners Oglesby and Wightmann made inspections on special trains, with Commissioner Knott trailing them on a regular train.

Particular criticism has been made because employees of the grain department at Kansas City have been permitted to absent themselves from duty on political missions.

One of the first bills certain to be introduced in the next legislature will be a measure abolishing the board. Such a

bill failed of passage two years ago when introduced in the Senate, and if opposition to the measure develops next session another bill is sure to be offered separating the railway board from the grain inspection department.

Governor Hadley is known to favor the abolishment of the railway commission. He wants it supplanted by a State Public Utilities Commission. The public utilities bill died in the last legislature, not because it provided for abolishing the railway commission, but because the utilities law passed in the Folk administration had not received a fair test.

The grain inspection department as now constituted is anything but satisfactory to the boards of trade of the large cities. Charges frequently have been made that the inspectors employed by this department are not expert grain men and are utterly unfit to determine the different grades of grain. The complaint is made that the crudity of the work of one inspector is killing St. Louis as a grain market.

Only under the dignity of proceedings for impeachment can a railway and warehouse commissioner, who has been guilty of omission of duty or overtly culpable in the conduct of his office be removed.—*St. Louis Republic.*

Commissioner Henderson's Views.

Marked improvement is shown in the relations of the railways to the people in the last year, according to Charles Henderson, president of the Alabama Railroad Commission, who is just home after an inspection made in 30 counties. There is an increase in these excellent conditions over the year before, and thus it is indicated that all the time things are getting better. Captain Henderson finds that claims for overcharge and damages are paid with more promptness and to greater satisfaction. He also discovers the feeling between the local agent as to the people is more cordial and agreeable, and that the roads are reaping benefits from the bettered relations. Depots are better and there are more of them, and conditions are, as a whole, more conducive to good conditions. Captain Henderson is greatly pleased with the disposition of the railways to meet every demand made by the state.—*Montgomery Press Despatch.*

Radical Railway Legislation in Texas.

As stated in the *Railway Age Gazette* of September 2, page 443, the Texas legislature has passed a bill providing that the purchasers of any railway property under execution sale shall take title to its franchise privilege only upon condition that they shall file with the Secretary of State a written agreement to pay all of its unsecured debts and subject the property to a lien for that purpose. The specific purpose of the law is to insure the payment of unsecured claims against the International & Great Northern, amounting to $2,000,000, but it is drawn in general terms, and was bitterly denounced by certain members of the legislature on the ground that it amounted to a repudiation of mortgage debts on railway properties. Senator Senter, who made the principal speech against the bill, said in part:

"This is a statutory prohibition upon the issuance of a mortgage by a railway company. It stipulates in terms that if a creditor of a railway company takes security for his debts he shall not have security, and, if he fails to take security for his debts, he shall have a preference lien. It provides that if his debt is secured it shall be unsecured, and if it is unsecured it shall be secured. It says, in terms, that a contract shall not be a contract and that a man who is without a contract shall have one by operation of law. Such provisions were never before embodied in a statutory proposal, and they are indeed amazing to any legal mind. * * * Yet I have just learned that the receiver of the road and the personal attorney of Mr. Gould applied to the railway commission for a revaluation of that railway in accordance with its present value in order that they might raise funds to pay all the debts of the company and take it out of the hands of a receiver; that they had arranged with bankers in the East for the sale of securities thus to be issued in order to pay off all of the debts of the company; that the railway commission refused to revalue the road and insisted upon holding it at the valuation made in 1894, which was based upon the conditions then existing and which placed its value at twenty-three millions of dollars.

"This valuation, it seems, was not made for the purpose of authorizing the issuance of bonds, but was rather an approximate and perfunctory valuation of the property.

"The State of Texas, through its taxing authorities, has valued the road for taxing purposes at thirty-five millions of dollars. This, then, is the attitude in which the State of Texas stands toward the railway company. For bonding purposes this property is worth but twenty-three millions of dollars, for taxing purposes it is valued at thirty-five millions.

"It may not sell securities to pay debts, which securities could be lawfully issued under the stock and bond law if we valued this property for bonding purposes just as we value it for taxing purposes. The state says to the railway company, although you shall not be permitted to mortgage your property to pay these unsecured debts, you must somehow contrive to pay them or we propose to put the ban of outlaw upon you. * * * If a creditor or stockholder shall choose to pay the debts he is not to be permitted to take any form of security for them; yet the very contention upon which this bill rests is that the property of the company is worth more than the amount of incumbrances upon it and that the lien holders are seeking to squeeze out the unsecured creditors. Was ever a more contradictory proposition submitted for the indorsement of the legislature. Will any sane mind assert that it is a honest measure?"

The only statement that we have seen to justify this law is that "there was a general feeling on the part of members of the legislature and others that the International & Great Northern should be made to pay its unsecured debts." A large part of the sum outstanding against the road consists of affirmed judgments in personal injury cases. A considerable amount of other damage claims and labor accounts is embraced in the total. This piece of legislation had its origin in the differences alluded to by Mr. Sentor, that arose some time ago between the State railroad commission and the road as to a revaluation of the property as a basis for the proposed bond issue under the reorganization. The road claims that unless the commission grants it the necessary authority to issue bonds to cover its indebtedness it will be unable to meet its unsecured claims. It is considered doubtful whether this difference as to valuation would have led to legislation on the subject had not certain damage suit lawyers purchased large amounts of the outstanding unsecured claims against the road.

Bids Wanted for Building New York Subways.

The New York State Public Service Commission, First District, on September 1 advertised in the principal cities of the country for bids for the construction of the proposed "triborough" subway railways, the estimated cost of which will be $125,000,000. The principal routes are from Battery Park at the south end of Manhattan Island northward through Church street, Vesey street, Broadway and Lexington avenue to the Harlem river; and thence on the west side of the city, through Mott avenue and Jerome avenue to Woodlawn road, Van Cortlandt park; and on the east side, through Southern boulevard and Westchester avenue to Pelham Bay park; a short line across the south end of Manhattan through Canal street; a line in Brooklyn from the Manhattan bridge through Lafayette avenue to Broadway and through Broadway to the Williamsburg bridge; lines in Brooklyn from Fulton street and Ashland place southward through Fourth avenue to the seashore, and a branch of the last named through New Utrecht avenue towards Coney Island. Three forms of contract are offered. No. 1 provides for the construction, equipment, maintenance and operation of the entire system by private capital, except some small portions that are already built or being built. No. 2 provides for building the Lexington avenue line to the Harlem river and short parts of the lines beyond that river, with money to be furnished by the city. No. 3 provides for the construction with the city's money of the Broadway-Lafayette line in Brooklyn and the Canal street line in Manhattan. The Fourth avenue line in Brooklyn is already under contract. The plans for the entire system cover 44.21 miles of line and 133 miles of track. The proposals for construction with the city's money apply to 25 miles of line and 81 miles of track and do not include equipment or operation. For those portions of the lines which are already under contract, the advertisements now ask bidders to present proposals for equipment, maintenance and operation.

The Public Service Commission, in deciding to issue these plans at this time, acted against the protest of one of its members, Commissioner Bassett, who holds that the cost will be

unnecessarily enhanced by having the tunnels two feet higher and seven feet broader than the present subway. This, he says, increases the cost without increasing the capacity. These plans for larger tunnels contemplate the use of full size standard cars of trunk line railways. The routes on which work is to be done are divided into 28 sections, and complete plans have been provided for each. For these books of plans and specifications bidders have to pay $5 each, or $100 for the entire set. For the contract forms $1 each must be paid. The commission has used 25 tons of paper for these plans and specifications, and the work, including maps, has cost $50,000.

Under the rapid transit law, as it now stands, these subways are to become the property of the city as soon as built, and competition is expected to take the shape of differences in the length of the term of the proposed lease. In bids for doing the work with the city's money, contractors are not to name lump sums, but must propose unit prices for the different kinds of work. The commission reserves the right to reject unbalanced bids. The city will acquire all real estate, rights and easements. Work must be begun within 60 days after the delivery of the contract. It is expected that the work can be done within four years, and there will be a clause empowering the city to retain 1 per cent. a month from the monthly payments if a contractor fails to complete the work in the time agreed upon.

The Trial of the Alleged Illinois Central Grafters.

The trial of F. B. Harriman, Charles L. Ewing and J. M. Taylor, formerly officers of the Illinois Central, charged with "grafting" in connection with the repair of cars for this road, continued last week in the municipal court of Chicago. F. C. Tarbott, formerly an employee of the Ostermann Manufacturing Company, testified as to how he and other employees of this company had removed parts from cars belonging to the Illinois Central, and put them on other cars, after which the Illinois Central had paid for these "repairs." Clarence H. Polley, formerly chief clerk of H. C. Ostermann, of the Ostermann Manufacturing Company, testified that in a space of four months, under orders from Mr. Ostermann, he had sent in bills for the repairing of 400 cars which had never been inside the Ostermann shops. He identified the original bills, which were produced in court, and which amounted to about $75,000. He said that the numbers of the cars entered on the bills were taken as the cars were being drawn along the track of the road adjacent to the Ostermann Company's plant by a switching engine. The bills were stamped with the name of R. Roth, car inspector of the Illinois Central at the Ostermann plant, to indicate that they were correct. Polley said that this stamp was sometimes put on the bills by himself and sometimes by Roth. He said that the Ostermann Company had certain standard rates that were charged for the alleged repairs of the cars, these rates being varied somewhat in the bills so as to make it appear that they had been charged for repairs actually made under different circumstances. The evidence given tended to indicate that a very large number of former officers and employees of the Illinois Central were cognizant of what was being done, and were sharing in the Ostermann Company's alleged fraudulent profits.

Popular Prejudice.

On what is probably the loveliest sheet of fresh water in the eastern states, Moosehead lake, in northern Maine, there is a little steamship company which plies from landing to landing over its 40-mile length. It has a maximum rate of $1.50 a ton for the freight it carries. There are three railways from which it can collect freight, there is no competition, and the rate itself does not seem unreasonable for the service performed.

The rate, in fact, when compared to that charged by private carriers, seems hopelessly inadequate. In the winter, a private individual, by means of sticking evergreens into the snow, marks out for himself a track over the ice, and teams the local freight on sledges. His charge is never less than $12 a ton, and if the weather is stormy and the snow inclined to drift he will charge $20, and get it.

Compared with the charge of the steamboat company, this looks like an extortionate monopoly. The Maine public, however, has developed a special conscience as regards corporations which would delight the heart of Mr. Roosevelt and others like him. The agitation against the steamboat rates is continuous. None of the complainants seems willing to start competition, although it cannot be pretended that there is any exclusive right of way over the lake. The impression seems to be rather that an individual may make handsome profits, but that good faith cannot be assumed in a corporation unless it is manifestly on the narrow edge of bankruptcy all the time.

This is no exaggeration. A protesting Maine shipper said publicly that the rates charged by the railways serving his state, particularly the Maine Central and the Bangor & Aroostook, must be excessive, because those roads had not given evidence of their good faith by going through a receivership. It is a condition of mind with which it is useless to reason, because the agitator of this type does not want to know the facts. He wants something for nothing, and our complaisant politicians are willing to give him what he wants, so long as the gift is made at a corporation's expense.

Public opinion has become positively diseased on the question of corporation rights. It is hardly possible to name a prominent politician who is not so cowed by popular clamor that he is afraid to tell the public when it is wrong. This newspaper holds no brief for the corporations, and they probably fear its criticism far more than that of the noisiest politician of them all; but in this senseless agitation against corporate industry the American citizen is cutting off his nose to spite his face.—*Wall Street Journal.*

The Federal Stock and Bond Commission.

President Taft, on Saturday last, announced the names of the men whom he has appointed members of the commission authorized by the Interstate Commerce law of last June to investigate the question of federal regulation of railway stock and bond issues. The chairman is Dr. A. T. Hadley, president of Yale University, author of "Railroad Transportation," and well known as an expert in railway finance and in the relation of the railways to the public. The other members are F. N. Judson, of St. Louis; Frederick Straus, of New York; Walter L. Fisher, of Chicago, and Prof. B. H. Meyer, of Madison, Wis. Mr. Judson is a graduate of Yale and author of several books on Interstate Commerce and other legal questions. In 1890 he was cousel for the government in the case against the Santa Fe concerning rebates paid to the Colorado Fuel & Iron Company. Mr. Straus is a member of the firm of Seligman & Co., bankers, New York City. Mr. Fisher was attorney for the city of Chicago in the settlement of the complicated relations between that city and the railway companies four years ago. He is said to be the author of the plan whereby the city and the street railways now divide the profits from the operation of the lines. Prof. Meyer is chairman of the Wisconsin State Railway Commission and has written valuable books on railway subjects.

Railway Facilities in New York 55 Years Ago.

From a time-table of the old New York & Harlem Railroad dated Dec. 17, 1855, it appears that this line furnished the first real rapid transit that Harlem and the Borough of the Bronx enjoyed. There were 12 trains each way per day for passengers. Of these one was a milk train and another was a way freight, which carried way passengers. One train was an Albany express, running to Chatham Four Corners, where it connected with the Western (Boston & Albany) Railroad; one was a Dover Plains express, three White Plains trains, and five were Williamsbridge trains.

With the exception of the freighter, all these trains started from the Tryon Row Station, where the old Staats-Zeitung building stood (near the city hall, about three miles south of 42d street). They were drawn by teams of four horses [four to each car] as far as 32d street, where the locomotive was attached, stopping on the way at Canal street, Broome street, Houston street and Eighth, Sixteenth and Twenty-sixth streets for passengers. Travel was slow under these circumstances, and if a man missed his train at Tryon Row he boarded the first northbound horse car, and it was about an even chance whether he would arrive at 32d street before the train or too late.

At Broome street there was a ticket office, with a siding for two and sometimes three or more cars, which fell in behind the first car from City Hall. The conductor was always on the last car, so that if there was any delay, detention or other trouble the car would not be left behind. At Broome street a

ticket agent boarded the train and sold tickets to all who were without them. His coat was a curiosity in its way, being covered with little pockets, each being for tickets for a different destination. There were ticket stations at Yorkville, now 86th street; Harlem, now 125th street; Mott Haven, Melrose, Morrisania and Fordham. The first train in the morning left White Plains at 5 o'clock and arrived at City Hall at 6.45. Even in those days the people boasted of some luxuries. One was the theatre train, which started from City Hall at 11.20 p.m., but went no further than Williamsbridge (10 miles from 42d street; now in New York City). In those days 42d street, now the Grand Central Station, was but a signal station.

One of the rules read: "Trains coming into New York must not be detached from the engine until they have passed 42d street."

The engine house at this time stood on the west side of Fourth avenue, where the Park Avenue Hotel stands; after the engine was detached it ran ahead, while the cars ran by their own momentum to 27th street, where horses were hitched and drew them down to City Hall. The passenger cars, heated by wood fires, were lighted by small lamps at either end. These shed but little light, so it became a practice with many of the commuters to carry pocket or folding lamps which burned candles.

Some of the trains went as far as Mott Haven, turned around and went back again. The only house there was a little tavern on the east side that was patronized by target companies, as was also the River House, which was on the Manhattan side of the Harlem river, at Fourth avenue, near 132d street. Fordham also had an engine shed, and previous to 1855 a train stayed there over night and left in the early morning.—*New York Times.*

Estimates for Subways in Toronto.

The city of Toronto, Ont., has been considering the construction of subways to relieve the congestion of traffic on some of its principal streets in the center of the city, and has had the subject reported on by Forgie, Jacobs & Davies, of New York. Lines were considered which would cover a dozen miles of streets and cost $24,000,000, but the engineers reported, in substance, that the congestion is not yet very severe and that probably it will be 10 years before such a system would be self-supporting. And it would be essential to have the underground line operated in connection with the surface lines now in existence. In 20 years, however, that is to say, in 1930, Toronto will feel acutely the need of additional transit facilities. The engineers recommended that, when the subways are built, they be made close to the surface; that the funds for construction be raised by pledging the credit of the city, and that equipment and operation be let to an outside company.

Association of Railway Electrical Engineers.

At the convention of this society to be held September 27-30 at the La Salle Hotel, Chicago, papers will be presented on the following subjects: "Electric Lighting of Railway Cars," "Axle Generating Systems," "Electric Traction on Trunk Lines," "Motor Driven Machine Tools," and "The Illumination of Railway Passenger Stations and Machine Shops."

The officers of the association are: E. M. Cutting, Southern Pacific, president; J. R. Sloan, Pennsylvania, vice-president; F. R. Frost, electrical engineer A. T. & S. F., second vice-president; George B. Colgrove, chief electrician, Illinois Central, secretary and treasurer.

Western Canada Railway Club.

The first regular meeting of the fall season will be held September 12 at the Royal Alexandra Hotel, Winnipeg, Can. A paper, "Should the Brake Power on Freight Cars be Increased?" which appeared in the May proceedings of the club, will be read by Thos. Clegg, air-brake instructor, Canadian Pacific.

New York Railroad Club.

The first regular meeting of this club for the fall season will be held on Friday evening, September 16, at the United Engineering Societies building, 29 West Thirty-ninth street, New York. B. S. Hinckley, engineer of tests, New York, New Haven & Hartford, will present a paper entitled "The Testing Department of a Railroad."

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.
AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; next meeting June 22, 1911; Niagara Falls, N. Y.
AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn.
AMERICAN ASS'N OF LOCAL FREIGHT AGENTS' ASS'NS.—G. W. Dennison, Penna. Co., Toledo, Ohio.
AMERICAN ASS'N OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew Bldg., Cincinnati, Ohio; Sept. 9-10; St. Louis.
AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; semi-annual, Nov. 16; St. Louis. Mo.
AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago; Oct. 18-20; Denver, Colo.
AMERICAN RAILWAY ENGINEERING AND MAINT. OF WAY ASS'N.—E. H. Fritch, Monadnock Bldg., Chicago; March 21-23, 1911; Chicago.
AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; May 9, 1911; Detroit, Mich.
AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony Building, Chicago.
AM. RAILWAY TOOL FOREMEN'S ASS'N.—O. T. Harroun, Bloomington, Ill.
AM. SOC. FOR TESTING MATERIALS.—Prof. E. Marburg, Univ. of Penn., Phila.
AM. SOC. OF CIVIL ENGS.—C. W. Hunt, 220 W. 57th St., N. Y.; 1st and 3d Wed., except July and Aug.; annual, Jan. 18-19, New York.
AM. SOCIETY OF ENGINEERING CONTRACTORS.—D. J. Haner, 13 Park Row, New York,; annual, Sept. 27-29; St. Louis, Mo.
AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 29th St., New York; annual, Dec. 6-9; New York.
AMERICAN STREET AND INTERURBAN RAILWAY ASS'N.—H. C. Donecker, 29 W. 39th St., New York; Oct. 10-14; Atlantic City.
ASSOCIATION OF AM. RY. ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; April 26, 1911; New Orleans, La.
ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; May, 1911; Montreal, Can.
ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—G. B. Colegrove, I. C. R.R., Chicago; annual, Sept. 27-30; Chicago.
ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 185 Adams St., Chicago; June 19, 1911; Boston.
ASS. OF TRANS. AND CAR ACC. OFFICERS.—G. P. Conard, 24 Park Place, N. Y.; Dec. 13-14, Chicago; June 20-21, 1911, Cape May City, N. J.
CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.
CANADIAN SOCIETY OF CIVIL ENGS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays; Montreal; annual, last week January.
CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month; Chicago.
CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.
ENGINEERS' SOCIETY OF PENN.—E. R. Dasher, Box 704, Harrisburg. Pa.
ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton bldg., Pittsburgh; 1st and 3d Tues.; annual, Jan. 17, 1911, Pittsburgh.
FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Rich., Fred. & Pot. R.R., Richmond, Va.; 20th annual, June 21, 1911; St. Paul, Minn.
GENERAL SUPERINTENDENTS' ASS'N OF CHICAGO.—H. D. Judson, 209 Adams St., Chicago; Wednesday preceding 3d Thursday; Chicago.
INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; next convention, Omaha, Neb.
INTERNAT'L RY. FUEL ASS'N.—D. B. Sebastian, La Salle St. Station, Chicago.
INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.
INT. RY. MASTER BLACKSMITHS' ASS'N.—A. L. Woodworth, Lima, Ohio.
INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.
IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.
MASTER CAR BUILDERS' ASS'N.—J. W. Taylor, Old Colony Bldg., Chicago.
MASTER CAR AND LOCO. PAINTERS' ASS'N OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass.; annual, Sept. 13-16; St. Louis.
NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, ex. June, July, Aug. and Sept.; Boston.
NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.
NORTH-WEST RAILWAY CLUB.—T. W. Flanagan, Soo Line, Minn.; 1st Tues. after 2d. Mon., ex. June, July, August; St. Paul and Minn.
NORTHERN RAILWAY CLUB.—C. L. Kennedy, C., M. & St. P., Duluth; 4th Saturday; Duluth, Minn.
OMAHA RAILWAY CLUB.—A. H. Christiansen, Barker Blk.; Second Wed.
RAILWAY CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City; 3d Friday in month; Kansas City.
RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, Pittsburgh, Pa., 4th Friday in month, except June, July and August; Pittsburgh.
RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.; annual, Oct. 11-13; Richmond, Va.
RAILWAY S'KEEPERS' ASS'N.—J. P. Murphy, Box C. Collinwood, O.; annual, May, 1911.
RICHMOND RAILROAD CLUB.—F. O. Robinson; 2d Monday; Richmond.
ROADMASTERS' AND MAINTENANCE OF WAY ASS'N.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; annual, Sept. 13-16; Chicago.
ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.
SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago; Oct. 25 and 26; Hotel Chamberlin, Old Point Comfort, Va.
SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. R. Ry., Montgomery, Ala.; annual, Oct. 20; Atlanta.
SOUTHERN & SOUTHWESTERN R.R. CLUB.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs., Jan., Mar., July, Sept. and Nov.; Atlanta.
TOLEDO TRANSPORTATION CLUB.—L. G. Macomber, Woolson Spice Co., Toledo; 1st Sat.; annual, May 6, 1911, Toledo.
TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; 1st Sat. after 1st Wed.; annual, Dec. 13; Buffalo
TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August; New York.
TRAIN DESPATCHERS' ASS'N OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 20, 1911; Baltimore.
TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo.
WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg; 2d Monday, except June, July and August; Winnipeg.
WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, Monadnock Bldg., Chicago; Wednesdays, except July and August; Chicago.

Traffic News.

The Rock Island has extended temporarily the time during which it will accept passenger fares of 2½ cents a mile in Arkansas.

The Hudson & Manhattan carried in August 3,536,712 passengers, a daily average of 114,000. This, compared with 2,662,187 for August, 1909, shows an increase of 24 per cent.

It is estimated that about 175,000 American tourists are now on the other side of the Atlantic, and all of these are expected to come home between September 15 and October 1. Steamship agents expect that their passenger travel this year will be the heaviest ever known.

The steamship lines running between New York City and Texas ports have announced increases of from 2 to 12 cents per 100 lbs. in the freight rates on the principal commodities, to take effect September 12. This is said to be the ending of a rate war which has been going on for some time.

The Bureau of Statistics of the Department of Agriculture estimates that the average condition of the cotton crop on August 25 was 72.1 per cent. of a normal, as compared with 75.5 on July 25, 1910; 63.7 on August 25, 1909; 76.1 on August 25, 1908, and 73.1 the average for the past ten years on August 25.

The Interstate Commerce Commission has changed from October 1 to December 1 the date on which the railways must comply with the recent order of the commission requiring a reduction of freight rates to interior western points (Salt Lake, Spokane, etc.). to make them more nearly equitable as related to the rates to Pacific coast cities.

The Interstate Commerce Commission has suspended a number of new freight tariffs that have been filed by the Kansas City Southern, and a number of other lines, which discontinue allowances heretofore granted to short "tap lines." The tap lines in question are lumber carriers, and it is charged that the proposed increases of from two cents per 100 lbs. to six cents will cause unreasonable discrimination.

The California State Railway Commission and officers of Wells Fargo & Co. have agreed on reductions in this company's rates amounting to about 16 per cent. The rates for short hauls are not to be changed, but there are to be substantial reductions in those for long hauls. Two months ago the commission issued an order reducing the rates about 19 per cent. The decision to reduce them only 16 per cent. was a compromise adjustment reached after conference with the officers of the company.

The railways of Texas have announced that on cotton sent to Galveston and destined to points out of the state, a reduction of four cents per 100 lbs. will be made at once, provided the Interstate Commerce Commission will waive the 30 days' notice. This decision means that to cotton destined to interstate and foreign ports the rates prescribed by the Texas Railroad Commission will be applied. It is a reduction from the 55-cent interstate to the 51-cent intrastate rate and terminates a rate controversy that has disturbed railway and cotton shipping circles.

The first telegraph tariff filed with the Interstate Commerce Commission, under the revised Interstate Commerce Commission Law, was sent in August 31 by the Telepost Company, 225 Fifth avenue, New York. The Telepost Company has a line from Portland, Me., to Boston, Mass.; one from Chicago to St. Louis and Kansas City, and also has connections to Omaha, Terre Haute, Indianapolis and Louisville. Patrick B. Delany, formerly well known in Western Union Telegraph circles, is consulting engineer of the company. The rates are very low.

The railways generally throughout the southern states have announced regulations for certification of bills of lading for cotton similar to those of the Southern Railway heretofore noticed. Agents are forbidden to give bills of lading until they actually get the cotton; a special agent pastes on the bill of lading a certificate of the genuineness of the signature of the local agent and for shipments to Europpe copies of bills of lading will be sent to the agents at the seaboard; but only the original bill of lading will be negotiable. Shippers will be required to accept the conditions by signing the bill of lading. The Louisville & Nashville has designated 10 agents who will be authorized to validate cotton bills of lading. Some of the railways west of the Mississippi, notably the Rock Island, have adopted these rules.

Chicago Hearings in Rate Advance Cases.

Examiners Brown and Hillyer, of the Interstate Commerce Commission, took testimony throughout last week at Chicago in the proceedings involving the advance in rates for which the western railways are seeking the consent of the Interstate Commerce Commission. A feature of the hearings was a constant effort on the part of the attorneys for the shippers who are opposing the rate advances to make it appear on cross examination that the large increases in the operating expenses of some roads have been due to the fact that the managements have been padding the operating accounts. The result of this was that President Ripley, of the Santa Fe, after he had retired from the witness stand, sent to the examiners a statement, which was read into the record by T. J. Norton, general attorney of this road. Mr. Ripley said that in addition to following the requirements of the government regarding the keeping of the accounts, the company has its accounts examined every year by independent auditors, and he included a statement from Price, Waterhouse & Company, in which they certified that they had examined the books of the Santa Fe, and had found them correctly kept. Mr. Ripley's statement concluded as follows:

"If either the Interstate Commerce Commission or the shippers have any doubt respecting the accuracy of Sante Fe records, or of the honesty of the company's course, we hereby tender to them the opportunity of making personal inspection of our books, and we also offer to put at their disposal all the employees that they may need and render them every other assistance in our power to aid in making, for the record in this case, a thorough investigation."

On cross-examination, Attorney Atwood, representing the shippers, questioned Mr. Ripley at much length regarding the capitalization of the Santa Fe. Mr. Ripley testified that in the reorganization of the property in 1896 its securities were so reduced as to lower its annual fixed charges from $9,000,000 a year to $4,500,000. He believed that the securities issued on the reorganization represented approximately the cost and the value of the property. He further expressed the belief that the existing capitalization of approximately $530,000,000 represents about the true physical value of the property. He was asked by Mr. Atwood how much importance should be attached to the factor of capitalization, or the value of the property, in determining the reasonableness or unreasonableness of rates, and replied, "I think that is one of the factors and a very important one. So long as the railways of this country are run by private capitalists, so long their return has got to be both safe and attractive. The maker of the rate, in the first instance, must so make the rate as to permit of the freest interchange of commodities, regardless of the capital of the railway and almost regardless of the cost of the service. That is what the maker of the rate has got to do if he is going to get the best out of his property. When it comes to limiting the rate by law, it is another proposition. Then you have got to consider the cost, interest on capital, and everything else. So long as the rate-maker makes a rate that does not bear heavily on any community and permits the very fullest interchange of commodities all over the country, thereby helping commerce, so long he ought not to be interfered with. As to the Interstate Commerce Commission, I think it should consider the value of the service to the shipper first and foremost, and give to the question of the cost and the valuation of the properties altogether secondary consideration. If there was one railway in this country reaching from east to west, with no competition, on which you were to fix the rates absolutely *de novo*, with the fixed idea of producing a return on the investment in it, that would be one question. Then you would have to take into account its capitalization. You would have to take into account the cost of the service. But no such condition exists in this country. The rates must be made on an entirely different basis. This idea that rates ought to be based on cost is a fallacy. The defenses on the basis of cost that have often been made by railways against proposed reductions in rates have had their foundation in fact as arguing against an arbitrary legal reduction in rates, but in forming the judgment of what a rate ought to be, the matter of cost should play a very small

part." Mr. Ripley was followed on the witness stand by W. E. Bailey, general auditor of the Santa Fe, who gave many statistical details to substantiate the more general statements which had been made by Mr. Ripley.

James Peabody, statistician of the road, estimated that if the advances in rates which were in question at the hearing went into effect the earnings of the Santa Fe would be increased about $95,000 a year. He said that, whereas between 1903 and 1910 the mileage of line of the Santa Fe had increased 14.6 per cent., its additional trackage had increased 84 per cent. Between the same years freight earnings increased 42 per cent. and freight operating expenses increased 70 per cent. Meantime, taxes have increased 102 per cent. Mr. Peabody stated that the amount paid by the Santa Fe in wages in 1910 was $7,000,000 more than the amount paid in 1909. An attempt having been made by counsel for the shippers to show that the cost of relining a tunnel, over $700,000, had been charged improperly to operating expenses, Mr. Peabody said that "every year things of that kind occur. In 1903 a very large amount was charged against operation because of floods, the total being about $1,000,000. These expenses cannot be spread over succeeding or preceding years." Mr. Peabody showed that whereas between 1903 and 1909 the increase in the tonnage of carload freight was 7.41 per cent., the increase in the tonnage of the cars in which it was carried meantime was 11.68 per cent., so that the road had to haul more dead weight in hauling a ton of freight in 1909 than in 1903. He contended that the growth of operating costs illustrates as clearly as anything can the necessity of advancing freight rates. "The money needed for the increased costs and increased facilities," he said, "must be supplied somehow. Either it must come from an advance in freight rates or the roads must borrow money. We cannot borrow money unless we have the increased freight rates, and if we could we would have to have the rate increased to pay interest on the borrowed money. I believe all the railways should provide a sinking fund of 1½ per cent. of the value of their property for meeting expenses which do not increase earnings and that this fund should be supplied out of earnings."

W. A. Poteet, chairman of the Trans-Missouri Freight Bureau, placed in evidence the tariffs involved. Counsel for the shippers raised the question whether the rates had been agreed upon at meetings of railway traffic officers, and Mr. Poteet stated that they had been. Counsel for the shippers then raised the point that agreements regarding rates were in violation of the anti-trust law, but Examiner Brown stated that the point raised was without merit; that the Commission was investigating the reasonableness of the rates and not the legality of the way in which they were made.

F. O. Melcher, vice-president of the Rock Island, testified regarding various increases in railway expenses. His testimony was briefly referred to in these columns last week. He showed that most of the increases in wages were in pursuance of decisions of federal boards of arbitration. He introduced a table showing that increases in wages made between February 1, 1906, and June 1, 1907, had increased the expenses of the Rock Island $109,507 a month, and that increases made this year had increased its expenses $108,280 a month. He gave the following figures showing the actual and estimated increases in expenses that have been or will be caused by wage advances: Fiscal year 1906-07, $528,000; 1907-08, $1,314,000; 1909-10, $1,451,800; 1910-11, $2,485,000; 1911-12, $2,612,000. Referring to other changes that had caused increases in expenses he mentioned the fact that steel coaches weigh 139,000 lbs., as against the 113,000 lbs. which wooden cars of the same kind weigh. In consequence, the Rocky Mountain Limited on the Rock Island in 1909 weighed 775,000 lbs., and in 1910 it weighs 833,000 lbs. This increase in the weight of equipment increases the cost of hauling it. A wooden chair car costs $11,000, while a steel chair car costs $13,660. In the fiscal year just closed the earnings of the Rock Island increased by $5,036,000, while its operating expenses increased $5,555,000.

He stated that he could not foresee any economies which would tend to check the tendency of operating expenses to increase faster than earnings. He also referred to the increase in expenses caused by requirements imposed by federal and state laws, such as the safety appliances law, the hours of service laws, etc. He said he did not criticize such legislation, but said that it does cause increases in expenses. The reciprocal demurrage laws in the different states had prevented economies in operation and did no one any real good. Referring to the demands of the public for safer and better transportation, he referred to the fact that since 1906 the Rock Island has installed 954 miles of automatic block signals. These signals are now adding to the expenses of maintaining the property at the rate of $90,000 a year, and in a year or so the road probably will be spending $150,000 a year in the maintenance of signals. Mr. Melcher read the following statement by the Iowa railway commission, which, he said, expressed his views: "Public attention has been in the past largely given to the subject of freight and passenger rates rather than toward compelling the railways to improve their tracks and roadbed in the interest of safety, and the latter is infinitely more important than the former." He estimated the physical value of the Rock Island at $404,000,000, which exceeds its capitalization.

Frank Nay, comptroller of the Rock Island, estimated that the proposed increases in rates in question would increase the earnings of the road $142,700. He said that the operating revenues in 1910 were $63,080,428, as compared with $58,053,704 in 1909. The net operating income was $11,102,000 in 1910, or enough to pay 3.77 per cent. on the road's book value of $294,314,051. Its net return had decreased since 1907, which was the best year in the thirteen for which he gave figures. The average rate per ton mile had declined from 9.53 mills in 1907 to 9.17 mills in 1910. If the average rate had been as high in 1910 as in 1909 the revenue would have been $600,000 greater. During July, the first month of the present fiscal year, operating expenses increased $281,454, and operating income decreased $379,000, as compared with the same month of 1909. For three weeks of August the freight revenues had decreased $245,000, and the total decrease for the seven weeks of the fiscal year was $355,000.

Henry Miller, vice-president and general manager of the Wabash, gave testimony indicating that this road very much needs higher rates. He said that it emerged from a reorganization some years ago without any money in its treasury, and has been in that condition practically ever since. It has never paid a cent in dividends since and has never been able to sell its bonds at par. During the last fiscal year it earned about $50,000 in excess of its fixed charges, but it has had deficits in many years which have been prevented from throwing it into insolvency only by the borrowing of money for short periods at high rates of interest to tide it over. The road is operated as economically as can be in the circumstances, but it could be operated much more economically if it had the money to spend on needed improvements. Since 1905 it has scrapped 100 locomotives and added 150, but it has not bought a freight car since 1907 nor a passenger car since 1904. In order to handle its business properly it needs new steel cars, more block signals, many new bridges, and second track between St. Louis and Detroit; between Chicago and St. Louis, and for over 100 miles between St. Louis and Kansas City, the traffic on all the parts of the line referred to having become too dense for economical operation on a single track. The wages which the road has to pay have increased $1,867,154 between 1903 and 1910, and increases in wages aggregating $300,000 have been made since January 1, and requests for increases from engineers, conductors, brakemen and shop men are under consideration. Payments for loss and damage to freight increased from $36,328 in 1899 to $512,892 in 1910. This increase was largely attributable to the rougher handling of trains since the introduction of the automatic coupler. Personal injury claims increased from $90,832 in 1901 to $392,454 in 1910. The hours of service law has added $175,000 a year to the expenses of the road; full crew laws have increased its expenses $50,000 since 1907, and the safety appliances laws, $320,833 since 1904.

T. J. Tobin, general auditor of the Wabash, submitted statements showing the results of operation of the Wabash for six years. No dividend was paid during this period. The deficit in 1905 was $1,459,372; in 1906 there was a surplus of $509,332; in 1907 a surplus of $461,465; in 1908 a surplus of $261,866; in 1909 a deficit of $159,259, and in 1910 a surplus of $545,719. The Wabash's taxes increased from $567,327 to $974,960 in ten years and the cost of filing and publishing its tariffs was increased $67,500 in five years by requirements of the Interstate Commerce Commission. The hearing at Chicago was adjourned to September 19.

The Illinois Manufacturers' Association on September 3 sent a telegram to President Taft asking that future hearings be conducted by the full commission instead of by examiners.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF JULY, 1910.

Name of road.	Mileage operated; end of period.	Operating revenues			Operating expenses						Net operating revenues (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or dec.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total, inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Alabama & Vicksburg	142	$80,510	$40,898	$131,730	$18,375	$19,900	$3,664	$42,274	$5,195	$89,408	$42,322	$49	$4,390	$37,981	$10,183
Ann Arbor	301	78,981	51,590	140,935	22,740	14,339	4,439	47,764	5,894	95,176	45,759	12	14,265	31,506	—5,717
Atchison, Topeka & Santa Fe	7,549*	4,222,430	1,927,414	6,670,330	1,021,160	970,396	121,812	1,960,155	136,310	4,209,834	2,460,496	.....	277,524	2,182,972	31,183
Atlantic Coast Line	4,491	1,419,792	563,723	2,148,064	334,854	349,233	43,192	794,813	68,557	1,590,648	557,415	.....	90,000	467,415	90,179
Bangor & Aroostook	599†	133,827	61,051	214,159	44,580	30,711	3,444	68,561	10,392	157,688	56,471	.....	1,500	54,971	—25,421
Bessemer & Lake Erie	204	807,135	42,019	859,514	83,520	113,518	9,255	205,201	8,360	419,854	439,660	.....	7,000	432,660	—76,057
Boston & Maine	2,243	1,873,812	1,585,505	3,751,230	501,761	430,627	49,550	1,527,027	84,582	2,593,548	1,157,682	12,181	160,667	1,009,196	—166,625
Carolina, Clinchfield & Ohio	236‡	82,141	16,956	103,814	10,000	22,928	5,012	24,294	8,324	70,558	33,256	.....	5,500	27,756	18,641
Charleston & Western Carolina	340	78,227	30,870	114,762	22,450	32,090	3,373	37,260	3,674	98,847	15,915	.....	4,475	11,440	—1,100
Chicago & Eastern Illinois	965	655,928	182,909	909,994	101,339	140,309	27,089	324,977	32,867	626,581	283,413	—2,944	29,900	250,569	—15,713
Chicago & Erie	269	274,187	74,169	382,980	50,878	88,969	20,645	166,761	8,589	335,842	47,138	.....	10,938	36,200	3,626
Chicago & North Western	7,629	3,968,213	1,837,436	6,404,222	1,038,369	663,575	125,712	2,463,182	148,694	4,439,532	1,964,690	—2,240	262,000	1,700,450	—128
Chicago, Burlington & Quincy	9,024	4,270,180	2,207,136	7,087,571	1,481,796	1,330,777	137,741	2,302,673	185,427	5,438,414	1,649,157	—11,946	250,454	1,386,757	—426,076
Chicago, Indiana & Southern	329	211,604	27,495	246,505	44,896	52,206	8,697	101,113	10,421	217,333	29,172	326	13,575	15,924	—30,439
Chicago, Rock Island & Pacific	7,396	2,985,190	1,740,598	5,038,586	865,835	648,438	155,926	1,933,531	124,879	3,738,609	1,299,977	—10 323	237,550	1,052,104	—378,901
Chicago, St. Paul, Minneapolis & Omaha	1,739	754,901	423,039	1,268,954	247,611	147,029	25,710	449,405	31,575	901,330	367,624	399	57,295	310,728	23,911
Cincinnati Northern	248	70,039	25,730	101,752	20,523	20,442	2,934	37,513	2 852	84,264	17,488	.....	4,500	12,988	—3,105
Cleveland, Akron & Columbus	212	141,304	52,661	209,226	43,336	38,354	3,016	71.881	3,859	160,446	48,780	.....	6,000	42,780	5,806
Cleveland, Cincinnati, Chicago & St. L.	1,982	1,404,542	759,960	2,376,081	419,102	433,939	103,905	1,049,806	59,743	2,066,496	309,585	—12,897	82,000	214,688	—444,661
Cumberland Valley	162	189,390	57,396	256,525	29,714	32,289	4,578	77,562	5,704	149,847	106,678	188	4,916	101,950	15,694
Delaware, Lackawanna & Western	930	2,056,779	749,484	3,007,936	396,362	490,024	68,121	837,967	54,034	1,756,508	1,251,428	—2,108	118,650	1,130,670	—363,053
Detroit, Toledo & Ironton	441	125,847	15,654	151,371	26,453	28,161	3,044	80,542	5,931	144,131	7,240	—52	6,712	476	—10,181
Duluth, South Shore & Atlantic	605	191,180	105,897	311,982	39,923	29,952	10,270	103,809	11,504	195,458	116,524	3,054	18,000	101,578	34,544
El Paso & Southwestern Co.	901§	467,689	84,244	584,959	84,260	70,576	11,039	165,889	22,087	353,851	231,108	—503	19,360	211,245	—23,424
Elgin, Joliet & Eastern	781	693,504	6	739,765	126,364	149,967	3,798	228,612	12,573	521,314	218,451	.....	15,400	203,051	—171,957
Erie	1,959	2,780,211	928,530	4,004,107	439,302	671,485	123,433	1,272,549	72,376	2,579,145	1,424,962	12,664	86,418	1,351,208	265,925
Evansville & Terre Haute	310	143,906	59,792	225,044	29,707	27,577	5,567	68,643	6,233	137,727	87,317	13,510	9,410	91,418	18,567
Florida East Coast	583	114,005	67,356	213,829	42,307	41,799	5,040	91,427	10,086	190,659	23,170	.....	13,731	9,439	6,227
Fort Worth & Denver City	454	231,473	153,198	403,662	61,084	68,025	8,259	132,945	13,872	284,185	119,477	—3,656	10,000	105,821	—54,285
Grand Rapids & Indiana	587	231,561	183,725	448,106	72,304	70,271	15,494	195,554	14,176	367,799	80,307	—1,048	24,748	54,510	—38,960
Great Northern	7,274‖	4,066,480	1,387,475	5,792,461	1,342,233	659,154	86,337	1,511,542	99,219	3,698,485	2,093,976	26,617	319,051	1,801,542	—259,249
Gulf, Colorado & Santa Fe	1,518	493,275	287,958	846,037	157,205	129,218	25,602	354,214	30,330	696,569	149,468	.....	32,325	117,143	14,601
Houston & Texas Central	789	315,491	143,060	493,132	68,965	61,781	17,359	207,678	21,143	376,926	116,206	.....	17,079	99,127	—22,210
Houston, East and West Texas	191	79,565	32,754	118,018	21,044	11,206	1,827	36,769	3,574	74,420	43,598	.....	3,290	40,308	7,121
Lake Erie & Western	886	307,423	92,044	426,378	75,586	88,693	17,215	162,527	13,452	357,473	68,905	.....	18,829	50,076	5,732
Lake Shore & Michigan Southern	1,663¶	2,469,460	1,111,229	4,029,892	693,086	591,226	125,558	1,393,819	87,541	2,891,230	1,138,662	—3,294	147,956	987,412	—452,482
Lehigh Valley	1,433	2,276,894	493,757	2,876,217	349,661	486,668	90,005	908,549	63,302	1,898,185	978,032	—45,337	92,200	840,495	—131,948
Long Island	390	251,122	866,120	1,164,865	102,854	109,100	22,672	394,832	22,641	652,099	512,766	112,812	43,570	582,008	18,662
Louisville & Nashville	4,590△	2,970,994	985,948	4,201,599	721,336	807,669	92,063	1,419,928	91,054	3,132,050	1,069,549	—11,545	137,800	920,204	—402,039
Louisville, Henderson & St. Louis	200	54,661	34,706	96,284	21,349	9,456	4,568	32,812	2,059	70,244	26,040	187	2,667	23,560	6,446
Maine Central	932	372,190	334,891	759,712	131,151	100,988	8,101	282,147	20,559	542,946	216,766	2,277	35,993	183,050	—104,662
Michigan Central	1,746	1,460,596	805,537	2,511,882	399,855	340,378	71,072	951,143	47,014	1,809,462	702,420	—7,318	113,150	581,952	—38,010
New Orleans & North Eastern	196	197,367	55,311	271,031	29,752	43,242	9,274	89,993	10,187	182,448	88,583	—355	8,250	79,978	18,366
New Orleans Great Northern	275	100,356	36,363	147,521	20,844	19,124	2,885	35,241	4.285	82,379	65,142	—86	1,250	63,806	32,106
New York Central & Hudson River	3,587	4,262,991	3,101,738	8,235,339	1,240,090	1,356,215	219,151	2,988,029	248,199	6,051,684	2,183,655	—43,334	418,870	1,721,451	—343,881
New York, New Haven & Hartford	2,041	2,417,566	2,391,887	5,269,633	636,451	564,134	22,085	1,925,807	142,175	3,290,652	1,978,981	112,135	343,000	1,748,116	—108,933
New York, Ontario & Western	546	609,213	288,540	941,455	104,784	112,868	14,125	290,123	14,651	536,551	404,904	—4,637	17,500	382,767	89,625
New York, Philadelphia & Norfolk	112	291,068	38,121	353,243	32,725	50,616	5,144	128,385	10,376	227,246	125,998	.....	6,850	119,148	—1,730
New York, Susquehanna & Western	152	144,699	63,127	234,209	28,093	25,256	4,490	85,443	4,481	147,764	86,445	—5,223	11,316	69,906	4,448
Norfolk & Southern	602	133,524	76,780	230,927	32,528	26,106	4,824	70,974	14,216	148,648	82,279	4,168	6,100	80,347	.....
Norfolk & Western	1,951	2,436,550	382,249	2,914,363	388,382	551,202	45,761	879,217	63,503	1,928,065	986,298	—608	93,000	892,690	—30,853
Northern Central	471	698,576	207,108	965,093	140,014	184,525	16,950	453,812	22,550	817,851	147,242	859	31,232	116,869	—40,838
Northern Pacific	5,814▲	3,926,434	1,907,803	6,247,336	1,002,989	729,690	96,566	1,848,484	86,936	3,764,665	2,482,671	67,645	281,130	2,269,186	—525,975
Pennsylvania Co.	1,416	3,661,974	769,258	4,777,553	644,214	769,720	86,703	1,603,423	86,550	3,190,610	1,586,943	—8,645	161,965	1,416 332	—239,297
Pennsylvania R.R.	3,970	9,080,377	2,988,020	12,918,395	1,831,317	2,344,533	206,125	4,573,747	221,170	9,276,892	3,641,503	—57,428	417,679	3,166,396	—465,115
Peoria & Eastern	351	188,903	58,441	268,617	44,592	45,862	8,023	110,347	6,567	215,391	53 226	.....	10,000	43,226	—23,353
Pere Marquette	2,328	807,523	449,496	1,372,509	166,934	186,227	48,015	557,610	35,020	993,806	378,703	—585	59,209	318,909	34,830
Philadelphia, Baltimore & Washington	717	945,659	610,960	1,711,178	258,395	261,610	27,823	673,151	32,701	1,253,680	457,498	.....	48,907	408,591	29,856
Pittsburgh & Lake Erie	191	1,328,024	165,345	1,528,575	163,453	138,034	13,587	338,535	24,813	678,422	850,153	—465	27,200	822,488	—50,580
Pittsburgh, Cincinnati, Chicago & St. L.	1,468	2,078,086	718,564	3,146,314	497,492	598,317	77,705	1,228,559	70,440	2,472,513	673,801	—969	123,824	549,008	—290,064
Rutland	468	14,376	114,011	293,333	43,207	38,340	7,107	100,146	5,471	195,271	98,062	.....	11,213	86,849	3,227
St. Louis Southwestern	773	417,447	112,334	553,992	61,663	96,543	24,222	152,143	21,429	356,001	197,992	—682	18,933	178,377	—29,662
Southern Ry.	7,050	3,037,208	1,399,051	4,779,651	595,655	873,911	118,199	1,668,462	137,869	3,394,096	1,385,555	5,251	166,717	1,224,089	9,100
Texas & Pacific	1,885	719,362	348,737	1,133,015	173,941	299,416	18,076	523,214	38,748	1,053,395	79,620	—5,659	38,000	35,961	—62,564
Toledo & Ohio Central	444	371,933	60.062	462,975	50,813	52,325	7,630	138,268	10.085	259,121	203,854	.....	14,930	188,924	92,809
Tennessee Central	292	77,608	35,390	120,099	14,752	10,580	5,058	33,560	7,408	71,358	48,741	.....	3,980	44,761	5,534
Vandalia	827	526,175	201,246	820,338	135,795	161,715	29,299	344,630	19,821	691,260	129,078	.....	27,758	101,320	—28,725
Vicksburg, Shreveport & Pacific	171	73 894	40,810	122,976	17,389	21,060	2,909	35,545	4,730	81,633	41,343	244	6,375	35,212	13,543
Virginia & Southwestern	188	75,274	12,930	91,453	11,782	21,191	1,408	25,252	3,031	62,664	28,789	.....	4,357	24,432	—6,943
Virginian Ry.	470 ♁	200,966	23,913	232,247	28,752	34,831	6,185	63,377	7,068	140,213	92,034	600	13,000	79,634	62,616
West Jersey & Seashore	353	163,524	612,990	811,933	94,984	60,803	17,863	237,698	10,022	421,370	390,563	—8,709	22,773	359,081	19,658

Mileage operated on July 31, 1909: * 7,459 miles; † 515 miles; ‡ 211 miles; § 867 miles; ‖ 6,976 miles; ¶ 1,511 miles; △ 4,498 miles; ▲ 5,692 miles; ♁ 444 miles. — Indicates Deficits, Losses and Decreases.

Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting statistical bulletin No. 77-A giving a summary of shortages and surpluses by groups from April 28, 1909, to August 17, 1910, says:

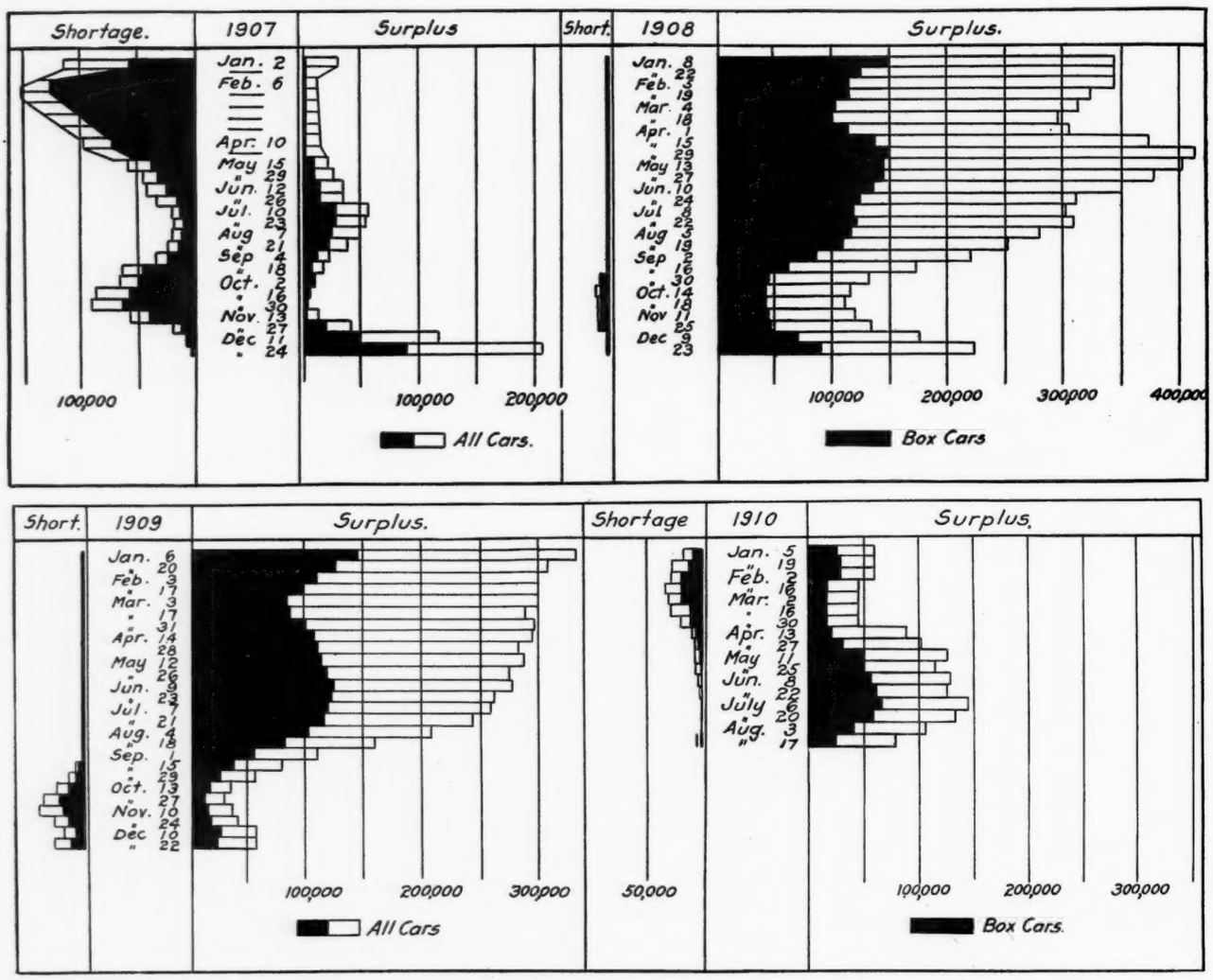
"There has been a further decrease in the surplus of 26,804 cars, being 25.4 per cent. of the total surplus reported in our last bulletin. Of this decrease, 13,756 cars are box, the decrease amounting to 33.5 per cent. of the last surplus reported for this class. Coal cars decreased 6,323, or 21.7 per cent. The largest decrease is in group 3 (Central), where the surplus was reduced from 25,256 to 16,602. In this group the surplus box decreased from 15,278 to 7,764. There is a quite general development of slight shortages of all classes, the total having increased from 2,783 to 5,081. In group 4 (North Atlantic) there is a scarcity of coal cars, the shortage of this class in that territory totaling 1,000 cars."

The accompanying table gives car surpluses and shortages by groups for the last period covered by the report, and the charts show surpluses and shortages in 1907, 1908, 1909 and 1910.

CAR SURPLUSES AND SHORTAGES.

Date.	No. of roads.	Surpluses: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Shortages: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—August 17, 1910	8	480	360	851	155	1,846	89	76	0	0	165
" 2.— " 17, 1910	22	2,966	126	7,003	7,465	17,560	19	11	136	47	213
" 3.— " 17, 1910	21	7,764	352	5,611	2,875	16,602	469	180	113	25	787
" 4.— " 17, 1910	10	1,438	116	237	521	2,312	113	252	1,000	0	1,365
" 5.— " 17, 1910	20	977	129	1,041	1,157	3,304	409	44	148	0	601
" 6.— " 17, 1910	22	5,507	627	2,907	4,227	13,268	178	7	6	100	291
" 7.— " 17, 1910	3	689	85	0	67	841	0	0	37	0	37
" 8.— " 17, 1910	12	3,017	82	3,017	2,202	8,318	0	1	9	5	15
" 9.— " 17, 1910	11	1,168	321	545	1,000	3,034	50	0	0	0	50
" 10.— " 17, 1910	19	2,583	710	1,547	5,245	10,085	701	92	15	143	951
" 11.— " 17, 1910	6	695	28	11	856	1,590	141	270	50	145	606
Grand total	154	27,284	2,936	22,770	25,770	78,760	2,169	933	1,514	465	5,081

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland, and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan, and Western Pennsylvania lines; Group 4—West Virginia, Virginia, and North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin, Minnesota, and North and South Dakota lines; Group 7—Montana, Wyoming and Nebraska lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Oregon, Idaho, California and Arizona lines; Group 11—Canadian lines.



Car Surpluses and Shortages in 1907, 1908, 1909 and 1910.

Railway Earnings and Expenses in Texas.

The Texas Railway Commission has made public statistics of the earnings and expenses of the railways of that state for the year ending June 30, 1910. They show that while gross earnings increased 4.87 per cent., operating expenses increased 6.63 per cent., so that there was a decrease in income from operation as compared with last year. The following are the figures: Freight earnings, $46,485,485; increase $2,239,181, or 3.60 per cent. Passenger train earnings, $28,211,389; increase $1,984,418, or 7.57 per cent. Other earnings, $1,430,287; increase $153,277, or 10.28 per cent. Gross earnings, $94,340,162; increase $4,376,877, or 4.87 per cent. Operating expenses, $72,216,024; increase $4,491,899, or 6.63 per cent. Income from operation, $22,124,138; decrease $115,022, or .52 per cent.

The Small Burden of Freight Rates.

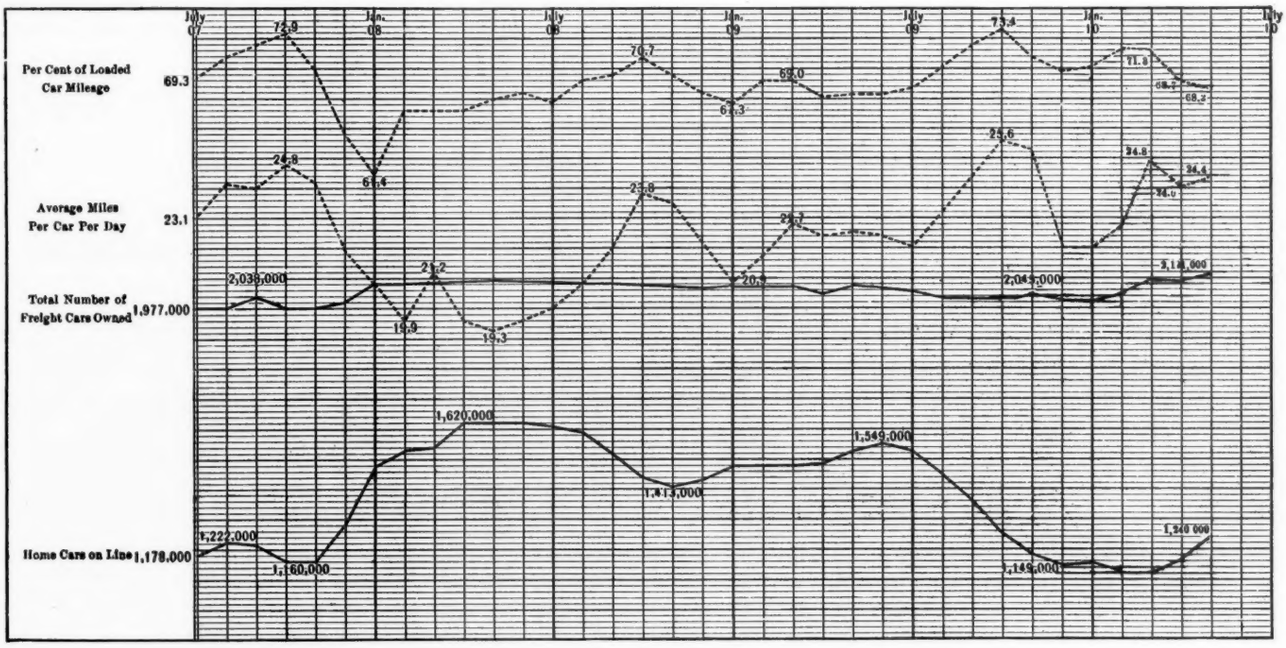
People seem to be doing a little figuring of late on their own hook concerning freight rates. A party of Topekans who were discussing this subject the other day told some personal experiences. A barrel containing two sets of dishes, worth $50 at retail, arrived at a Topeka freight house from a factory in Pennsylvania. It weighed about 125 lbs. It appeared that it was necessary for three different railways to haul this barrel of dishes on its journey of about 1,400 miles. The freight charges amounted to $1.47.

"And," continued the man who paid the freight bill, "it cost me 35 cents to have the same barrel hauled from the freight depot a short three-quarters of a mile to my house."—*Topeka (Kan.) State Journal.*

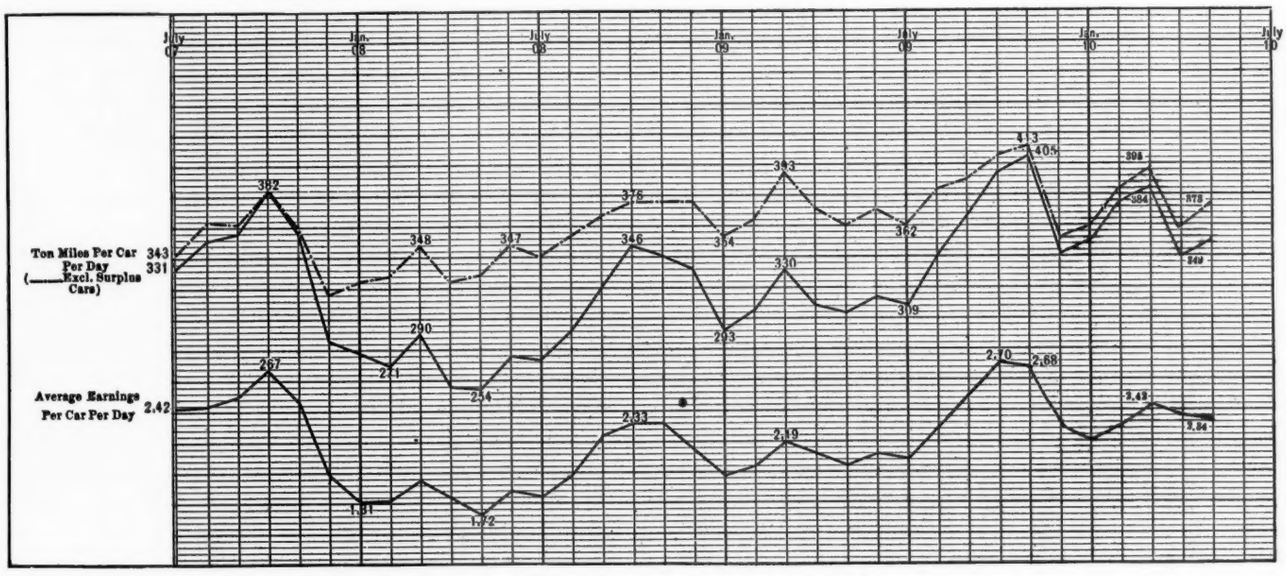
Freight Car Balance and Performance.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting statistical bulletin No. 80, covering car balance and performance for May, 1910, says:

"The performance during May was very similar to that recorded for April. There was a further reduction in the use of foreign cars, and the per cent. of cars on their home lines increased from 56 per cent. to 58 per cent., with a reduction in



Car Performance in 1907, 1908,, 1909 and 1910.



Car Earnings and Loading in 1907, 1908, 1909 and 1910.

CAR BALANCE AND PERFORMANCE IN MAY, 1910.

	New England.	N. Y., N. J., Del., Md., Eastern Pa.	Ohio, Ind., Mich., Western Pa.	Va., W. Va., No. and So. Carolina.	Ky., Tenn., Miss.,Ala., Ga., Fla.	Iowa, Ill., Wis., Minn.	Mont., Wyo., Neb., Dakotas.	Kan. Colo., Okla., Mo., Ark.	Texas, La., New Mex.	Ore., Idaho, Nev., Cal., Ariz.	Canadian Lines.	Grand Total.
Revenue freight cars owned	77,435	683,012	209,104	171,851	174,005	385,742	17,534	135,249	28,894	119,865	118,934	2,121,125
Average number of system cars on line	37,540	378,532	125,238	95,122	91,780	274,469	6,240	81,926	17,005	60,849	68,643	1,237,344
Railway-owned cars: Average foreign on line	39,928	274,918	103,025	62,791	56,075	148,601	12,973	44,539	20,699	54,178	28,781	846,508
Total cars on line	77,468	653,450	228,263	157,913	147,855	423,070	19,213	126,465	37,704	115,027	97,424	2,088,852
Excess	33	.....	19,159	.....	.....	37,328	1,679	.....	9,310	.....	.....	.....
Per cent. of cars on line to total owned:												
Home	48	56	60	55	53	71	36	61	60	51	58	58
Foreign	52	40	49	37	32	39	74	33	73	45	24	40
All railways	100	96	109	92	85	110	110	94	133	96	82	98
Private cars on line	3,018	36,601	10,708	3,594	6,516	16,027	1,147	6,340	2,825	10,102	2,535	99,416
Total, all cars on line	80,486	690,051	238,971	161,507	154,371	439,097	20,360	132,805	40,532	125,129	99,959	2,188,268
Per cent. of cars in shop	4.49	5.55	6.19	6.53	7.92	5.04	4.91	10.63	5.58	5.38	5.61	5.99
No. of freight engines owned	1,152	10,137	2,790	2,992	2,588	6,467	468	2,512	813	2,361	2,162	33,629
Average cars on line per freight engine owned	69	68	86	54	60	68	44	53	50	53	46	65
Total freight-car mileage	44,601,613	522,549,297	162,416,118	126,202,434	127,488,958	305,310,946	24,438,362	96,158,271	34,126,027	123,898,352	84,776,690	1,651,967,068
Average miles per car per day	17.9	24.4	21.9	24.7	26.7	22.6	38.7	23.4	27.2	31.9	27.4	24.4
Per cent. loaded mileage	75.2	66.1	67.3	64.8	68.6	68.5	75.1	66.3	65.7	68.5	84.2	68.2
Ton-miles of freight, including Company freight	502,835,549	8,106,756,510	2,303,067,107	1,922,307,496	1,698,944,925	2,748,676,174	370,100,199	1,318,134,692	456,575,726	1,718,281,174	1,169,402,346	22,315,081,898
Average ton-miles, including Company freight:												
Per car-mile	11.3	15.5	15.5	15.2	13.4	12.0	15.9	13.7	13.4	14.0	13.8	14.3
Per loaded car-mile	15.0	23.5	23.0	23.2	18.7	18.1	21.0	20.8	20.4	20.7	16.4	21.1
Per car per day	202	379	335	376	358	261	644	320	363	451	377	349
Gross freight earnings	$5,845,103	$48,116,869	$13,842,469	$11,016,552	$11,051,059	$29,072,575	$3,092,296	$10,023,242	$3,009,210	$15,203,095	$7,414,102	$157,686,572
Average daily earnings: Per car owned	$2.48	$2.27	$2.14	$2.07	$2.04	$2.43	$5.69	$2.39	$3.42	$4.09	$2.73	$2.43
Per railroad-owned car on line	2.43	2.38	1.96	2.25	2.41	2.22	5.19	2.56	2.57	4.26	2.76	2.45
All cars on line	2.34	2.25	1.87	2.15	2.31	2.14	4.90	2.43	2.39	3.91	2.69	2.34

the loaded mileage to 68.2 per cent. in May as against 68.7 per cent. in April. Compared with May, 1909, however, the cars on home lines were materially less, the difference amounting to 16 points in the percentage, or over 300,000 cars.

"Shop cars show an increase from 5.55 per cent. to 5.99 per cent., a natural result for this period of the year. The miles per car per day show an improvement from 24.0 to 24.4. This average, excluding idle equipment, was 26.1.

"There was an increase in the tons per loaded car from 20.9 in April to 21.1, and in the ton miles per car per day from 340 to 349. Earnings per car per day decreased from $2.35 to $2.34. These results reflect the improvement in coal traffic during the month."

The table shows car balance and performance for the period covered by the report, and the charts show earning and performance figures in the last three years.

Freight Rate Hearing in New York.

Messrs. George N. Brown and Frank Lyon, representing the Interstate Commerce Commission, resumed in New York on Wednesday of this week the hearing on the reasonableness of the extensive advances in freight rates which were announced last June by the Trunk lines and which were suspended until November 1 at the request of the commission. The hearings are held in the Waldorf-Astoria hotel. The Trunk Line Association was represented at the hearing by C. C. McCain, chairman. Among the railway men present were: Daniel Willard, Hugh L. Bond and George F. Randolph, of the B. & O.; D. W. Cooke, of the Erie; John B. Thayer and F. I. Gowen, of the Pennsylvania; G. W. Kretzinger, of the Grand Trunk; Edgar J. Rich, of the Boston & Maine; W. C. Kallman, of the New York Central; A. Patriarche, of the Pere Marquette, and R. T. Haskins, of the New Haven.

Among the representatives of shippers are: F. B. Montgomery, chairman of the Shippers' Traffic Committee, of Chicago; E. E. Williamson, commissioner of Receivers and Shippers' Association, Cincinnati; H. C. Barlow, traffic director of the Chicago Association of Commerce; Clifford Thorne, of Washington, Iowa, counsel for the Corn Belt Meat Producers' Association and Farmers' Crop and Grain Dealers' Association, and John H. Atwood, of Kansas City, Mo., general counsel; Francis B. James, attorney for the Shippers' Association and National Industrial Traffic Leagues, and Louis R. Brandeis, of Boston, counsel for the Seaboard shippers' organization. In this capacity he represents the Chamber of Commerce of the state of New York, the Merchants' Association of New York, Boston Fruit and Produce Exchange, Richmond Chamber of Commerce, Baltimore Board of Trade, Philadelphia Chamber of Commerce, Boston Chamber of Commerce and others.

Mr. Prouty Discountenances Reports That Railway Accounts Are Padded.

Commissioner Charles A. Prouty, of the Interstate Commerce Commission, at Chicago, September 2, repudiated stories alleged to have emanated from the office of the Commission in Washington to the effect that the accounts of the railways have been padded in order to strengthen their claim for an increase in rates. Mr. Prouty is fully convinced that the railways are keeping their accounts in the manner prescribed by the Commission.

STATE COMMISSIONS.

The State Railroad Commission of Louisiana proposes to make a general reduction in the rates to be charged by the express companies of the state and has issued a distance tariff showing the proposed rates. A hearing will be held at Baton Rouge, September 29.

The State Railroad Commission of Louisiana is considering the adoption of changes in its car demurrage rules and proposes to let down the bars for the farmers in very liberal fashion. Where freight is to be hauled in wagons three miles, the commission proposes to require the railways to allow 120 hours *additional* free time (or seven days in all); and where it is to be hauled 10 miles, 168 hours additional free time. A hearing is to be held at Baton Rouge, September 27.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

John Blackett has been appointed auditor of the Coahuila & Zacatecas, with office at Saltillo, Coahuila, Mex., succeeding Einar Olsen, transferred.

Daniel T. Pierce, executive assistant to Charles O. Kruger, president of the Philadelphia Rapid Transit Co. at Philadelphia, Pa., has resigned, effective September 15.

W. B. Jansen, vice-president and assistant to the president of the Atchison, Topeka & Santa Fe at Chicago, has resigned on account of ill health. E. J. Engel has been appointed assistant to the president and will succeed to the duties of Mr. Jansen.

The officers of the Brockville, Westport & Northwestern are now as follows: D. B. Hanna, president; J. D. Morton, vice-president; L. W. Mitchell, treasurer, and R. P. Ormsby, secretary, all with offices at Toronto, Ont. D. B. Hanna is president, J. D. Morton general auditor, L. W. Mitchell treasurer and purchasing agent of the Canadian Northern Quebec.

The officers of the Central Arkansas & Eastern, which is building a new line in Arkansas, are as follows: R. M. Foster, president; E. P. Melson, secretary; G. K. Warner, treasurer; S. H. West, general attorney; S. C. Johnson, general auditor, all with offices at St. Louis, Mo.; and S. G. Seabrook is claim agent, with office at Pine Bluff, Ark. All these officials are officers also of the St. Louis Southwestern with the exception of R. M. Foster and E. P. Melson.

Operating Officers.

Charles W. Kouns, general manager of the western lines of the Atchison, Topeka & Santa Fe, has been appointed general manager of the eastern lines, with office at Topeka, Kan., succeeding James E. Hurley, deceased. Mr. Kouns was born on October 22, 1854, at New Holland, Ohio, and began railway work in 1871 as a telegraph operator on the Kansas Pacific, now a part of the Union Pacific. Two years later he was made train despatcher on the same road, and in 1876 was appointed train despatcher of the International & Great Northern. The following year he was appointed chief clerk to the master of transportation of the Galveston, Harrisburg & San Antonio, and from 1877 to 1880 he was consecutively freight conductor, chief train despatcher and trainmaster of the International & Great Northern. He went to the Missouri Pacific in 1880 as train despatcher of the Eastern division, and the following year returned to the International & Great Northern as trainmaster. In 1883 he was appointed master of transportation of the Galveston, Harrisburg & San Antonio, and two years later was made division superintendent on the Union Pacific. In 1888 he went to the Atchison, Topeka & Santa Fe as superintendent of transportation. He held this position till 1907, when he was made assistant to the second vice-president. In March, 1909, he was appointed general manager of the western lines of the same company, which position he has held until now.

C. W. Kouns.

A. H. Otis has been appointed general manager of the Ocean Shore Railway, with office at San Francisco, Cal.

G. S. Flournoy, assistant general manager of the Fitzgerald, Ocilla & Broxton at Fitzgerald, Ga., has resigned.

M. B. Bayer, supervisor of transportation of the Oregon & Washington at Tacoma, Wash., has been appointed superintendent, with office at Tacoma.

R. E. Rinehart has been appointed car accountant of the Cincinnati, Bluffton & Chicago, with office at Huntington, Ind., succeeding D. R. Taylor.

F. C. Fox, general superintendent of the Eastern district of the eastern lines of the Atchison, Topeka & Santa Fe, has been appointed general manager of the western lines, with office at Amarillo, Tex., succeeding C. W. Kouns, promoted.

The following officers of the St. Louis Southwestern have had their authority extended over the Central Arkansas & Eastern, a new line building in Arkansas: J. W. Maxwell, general superintendent, Tyler, Tex.; E. A. Peck, superintendent, Pine Bluff, Ark., and F. J. Hawn, superintendent of transportation, Tyler.

J. O. Kelly, trainmaster of the Missouri Pacific at Jefferson City, Mo., has been appointed a trainmaster of the International & Great Northern, with office at Palestine, Tex., in charge of the Longview, Palestine, Galveston and Mineola sub-divisions. W. E. Miller has been appointed trainmaster of the Taylor sub-division, including Palestine yard, with office at Palestine.

In accordance with the Hine system of organization which has been established on the Southern Pacific Lines in Oregon and the Oregon Railroad & Navigation Company, the titles of general superintendent, superintendent of motive power and chief engineer have been abolished, and the following officers will hereafter be designated as assistant general manager: M. J. Buckley, general superintendent at Portland, Ore.; George W. Boschke, chief engineer at Portland; J. F. Graham, superintendent of motive power at Albina, Ore.; C. G. Sutherland, chief clerk to the general manager at Portland, and J. D. Stack, an assistant division superintendent on the Sacramento division of the Southern Pacific.

Traffic Officers.

M. E. Snyder has been appointed a traveling freight agent of the Northern Pacific, with office at Spokane, Wash., succeeding E. L. Hanke.

W. F. Gleeson has been appointed general freight and passenger agent of the Ocean Shore Railway, with office at San Francisco, Cal.

W. T. Dunne has been appointed a traveling freight agent of the Chicago, Peoria & St. Louis, with office at Chicago, succeeding L. Williams.

A. D. Aiken has been appointed a commercial agent of the Rock Island Lines west of the Mississippi river, with office at McAlester, Okla.

Herbert Wiley has been appointed a general agent in the passenger department of the Chicago, Indianapolis & Louisville, with office at Chicago.

F. D. Hunter has been appointed a general agent of the Chicago, Burlington & Quincy, with office at Billings, Mont., succeeding H. H. Swearinger.

Einar Olsen, auditor of the Coahuila & Zacatecas, has been appointed traffic manager, with office at Saltillo, Coahuila, Mex., succeeding E. C. Farrell, resigned.

H. R. Grier, general agent of the Tonopah & Goldfield at Goldfield, Nev., has been appointed district freight and passenger agent, with office at Goldfield, and his former position has been abolished.

H. St. John Waggaman has been appointed a commercial agent of the Houston East & West Texas and the Houston & Shreveport, with office at Houston, Tex., instead of traveling freight agent, as was previously announced in these columns.

H. O. Young, traveling freight agent of the Minneapolis, St. Paul & Sault Ste. Marie, at Boston, Mass., has been appointed New England agent, with office at Boston, succeeding H. A. Kennedy, deceased. H. J. Jernegan succeeds Mr. Young.

Percy R. Flanagan has been appointed general agent of the Chicago Great Western, with office at Spokane, Wash., succeeding W. E. Pinckney, resigned to go into other business. J. H.

Dengel, commercial agent at Kansas City, Mo., has resigned to go into other business.

W. J. Brown has been appointed a traveling agent of the Kansas City, Mexico & Orient, with office at New York, succeeding G. M. Guthridge, and J. F. Waggoner has been appointed traveling agent, with office at Los Angeles, Cal., succeeding H. K. Campbell.

E. M. Winstead, traveling freight agent of the St. Louis Southwestern at Houston, Tex., has been appointed commercial agent, with office at Houston, succeeding G. M. Winstead, resigned to engage in other business. Martin Henninger, soliciting freight agent, succeeds E. M. Winstead, and J. Bodenhomer succeeds Mr. Henninger.

H. E. Farrell, freight traffic manager; J. P. Park, general freight agent, and E. W. La Beaume, general passenger and ticket agent of the St. Louis Southwestern, all with offices at St. Louis, Mo.; and F. H. Jones, general baggage agent of the St. Louis Southwestern of Texas, Texarkana, Tex., have had their authority extended over the Central Arkansas & Eastern.

G. M. Kridler, general agent of the Lake Shore & Michigan Southern, the Lake Erie & Western, the Toledo & Ohio Central and the Zanesville & Western, at Pittsburgh, Pa., has been appointed division freight agent of the Lake Shore and the Pittsburgh & Lake Erie, with office at Youngstown, Ohio, succeeding H. F. Ledlie, resigned. B. J. Torbron, commercial agent at Toledo, succeeds Mr. Kridler.

H. C. Miller has been appointed a soliciting freight agent of the Chicago Great Western, with office at Kansas City, Mo. H. E. McElroy has been appointed a traveling freight agent, with office at Pittsburgh, Pa., succeeding G. A. Smith, promoted. R. W. Myles has been appointed a contracting freight agent at Pittsburgh, and E. E. Harold, a soliciting freight agent at Seattle, Wash., succeeding C. L. Lundquist.

C. M. Booth, first assistant general freight agent of the Pere Marquette at Detroit, Mich., has been appointed general freight agent, with office at Detroit, succeeding Percy F. Gaines, deceased. J. E. Williams, chief of the tariff bureau at Detroit, and R. P. Paterson, have been appointed assistant general freight agents, both with offices at Detroit. Mr. Williams will have general supervision of the tariff department and such other duties as may be assigned, and his former office has been abolished.

Engineering and Rolling Stock Officers.

C. M. Stansbury has been appointed master mechanic of the Ocean Shore Railway, with office at San Francisco, Cal.

The office of C. S. Thompson, superintendent of bridges and buildings, Colorado lines of the Denver & Rio Grande, has been transferred from Pueblo, Col., to Denver.

William Gill has been appointed master mechanic of the Iowa Central, with office at Marshalltown, Iowa, succeeding C. E. Gossett, transferred, instead of William Hill, as was previously announced in these columns.

C. Harder has been appointed mechanical engineer of the Kansas City Southern, with office at Pittsburgh, Kan., succeeding R. L. Langtim. J. E. McLean has been appointed master mechanic, with office at Pittsburgh, succeeding G. S. Hunter.

The following officers of the St. Louis Southwestern have had their authority extended over the Central Arkansas & Eastern, a new line building in Arkansas; C. D. Purdon, chief engineer; J. S. Berry, superintendent of bridges and buildings, both with offices at St. Louis, Mo.; T. E. Adams, superintendent motive power, Pine Bluff, Ark., and W. J. Williams, superintendent of telegraph, Tyler, Tex.

Purchasing Officers.

H. P. Abbey has been appointed purchasing agent of the Missouri, Oklahoma & Gulf, with office at Muskogee, Okla.

C. C. Anthony has been appointed purchasing agent of the Denver, Northwestern & Pacific, with office at Denver, Colo.

N. A. Waldron, storekeeper of the St. Louis Southwestern at Pine Bluff, Ark., has had his authority extended over the Central Arkansas & Eastern.

Railway Construction.

New Incorporations, Surveys, Etc.

Atchison, Topeka & Santa Fe.—The Santa Fe is seeking an entrance into Waco, Tex., and may use the tracks of either the St. Louis & San Francisco from McGregor northeast for about 20 miles, or the Texas Central from Morgan City southeast about 58 miles. If satisfactory arrangements cannot be made for trackage rights, the company may build its own line into Waco.

The Concho, San Saba & Llano Valley has opened for business the Sterling City district branch from San Angelo, Tex., northwest to Sterling City, 41.4 miles.

Buffalo Creek & Gauley.—This company, which was organized to build from Clay, W. Va., east to Huttonsville, about 75 miles, has laid track on about 13 miles. Work is now under way by C. P. Keeley & Co., Cressmont, W. Va., and Duffield & Reed, Clay. J. G. Bradley, superintendent, Clay.

Chicago & North Western.—The James River Valley line, built under the name of the James River Valley & Northwestern, has been opened for business from Gettysburg, S. Dak., south to Blunt, 40 miles.

Chicago, Milwaukee & Puget Sound.—The Tacoma Eastern has finished work on an extension from Glenavon, Wash., southwest to Morton, nine miles. The line is now in operation from Tacoma to Morton, 67.3 miles.

Concho, San Saba & Llano Valley.—See Atchison, Topeka & Santa Fe.

Covington, Big Bone & Carrollton.—Work has been started, it is said, on an electric line from Covington, Ky., south to Crescent Springs. It is estimated that the line will cost about $2,000,000.

Cuban Roads.—An act has been passed by the Cuban Congress, and approved by the president, authorizing the construction of a railway from Cifuentes, in the province of Santa Clara, west via San Diego del Valle, to La Esperanza. The new line is to connect with the lines of the United Railways of Havana or the Cuban Central.

Cumberland Railroad.—An officer writes that a contract has been given to S. P. Condon, Knoxville, Tenn., for building an extension of the main line from the present southern terminus, to Bush Mountain tunnel, in Kentucky, 2.7 miles; also for building the Tye Fork spur, from the extension of the main line, 2.7 miles long.

Duluth & Iron Range.—An officer writes that grading contracts have been given to Carl Hall & Co. and to John Runquist, both of Duluth, Minn., for building a logging spur from Spring Mine, Minn., to Dunka river, easterly about 12 miles, with a branch easterly about eight miles, and work is now under way. The track laying will be carried out by the company's men. Maximum grades will be two per cent. and maximum curvature 10 degrees.

Elizabeth City & Albemarle.—Plans have been made for building a line from Elizabeth City, N. C., south via Weeksville, 13 miles. The work will include a 40-ft. bridge. R. Johnson, Norfolk, Va., is the contractor. C. E. Kramer, president, Edenton, N. C.,; Patrick Mathew, chief engineer.

Fort Smith, Subiaco & Eastern.—This company, operating a line from Paris, Ark., to Subiaco, six miles, has been extended from Subiaco to Scranton, eight miles.

Garden City, Gulf & Northern.—This road is now open for traffic from Garden City, Kan., north to Scott City, 42 miles. (July 15, p. 142.)

Gulf & Magnolia Northern.—An officer writes that surveyors have started locating the route from Junction City, Ark., northwest towards Magnolia and Hope. It is expected that contracts will be let and work started early in October. The company has under consideration the question of building an extension from Atlanta, Columbia county, or from Threecreeks,

Union county, north to Camden, about 40 miles. (Sept. 2, p. 440.)

HUDSON & MANHATTAN.—The new Henderson street station, Jersey City, N. J., of the Hudson & Manhattan, was opened for business September 6, also a new extension which adds over one mile to the system and prepares the way for the final extension to Newark. Only one-half mile of tunneling will now have to be done in order to connect with the Pennsylvania tracks, over which the entrance will be made into Newark. Construction work is now going on and it is expected that the extension will be finished and in operation by the summer of 1911.

JAMES RIVER VALLEY & NORTHWESTERN.—See Chicago & North Western.

KENTWOOD & EASTERN.—The Bolivar line has been extended from Scanlon, La., to Foley, seven miles.

LEXINGTON & EASTERN.—According to press reports, this company has secured funds for building an extension from Jackson, Ky., southeast into the coal fields of Perry, Knott and Letcher counties, thence to a point in Virginia.

MOBILE RAILWAY & TERMINAL CO.—See Mobile, Ala., under Railway Structures.

MONTROSE & STATE LINE.—Incorporated in Pennsylvania with $150,000 capital, to build from Montrose, Pa., north to the Pennsylvania-New York state line, 15 miles. The incorporators include: H. E. Paine, president; W. J. Douglas, E. C. Randolph and R. E. Koehler.

NEW YORK SUBWAYS.—The New York Public Service Commission, First district, has asked for bids for the construction, equipment and operation of the tri-borough subway and elevated system of New York City, comprising about 44 miles of lines, bids to be opened about October 20. Bids are also asked for the construction of these subways with money to be provided by the city, these to be opened October 27. The bids may be made for one or more of the sections into which the construction work has been divided.

NORTH & SOUTH CAROLINA.—This road has been extended from Dillon, S. C., south to Mullins, 16.9 miles.

OREGON RAILROAD & NAVIGATION CO.—A contract is said to have been given to Twohy Bros. for building the cut-off from a point near Coyote, Ore., on the Columbia river, 25 miles west of Umatilla, southeast to Stanfield, 26 miles. The cost of the work will be about $800,000. The new line will be about 15 miles shorter than the present line. (July 29, p. 206.)

SAN PEDRO, LOS ANGELES & SALT LAKE.—According to press reports, contracts have been given to the Utah Construction Co. and to Shattuck & Edinger for work on 60 miles of line, which is to be located on higher ground than the existing line between Guelph, Nev., and Crestline.

SOUTH GEORGIA-WEST COAST.—This line has been extended from Perry, Fla., southwest to Hampton Springs, five miles.

STERLING-MOLINE TRACTION CO.—An officer writes that grading contracts are to be let soon to build from Sterling, Ill., southwest via Prophetstown, Morrison, Lyndon, Erie and Hillsdale to Moline. The general contract has been let to the Northwestern Engineering & Construction Co., 1318 Majestic buildings, Milwaukee, Wis. The maximum grades will be about 1 per cent. and maximum curvature 12 degs. There will be four or five steel bridges. W. E. Tuller, president, Morrison, and C. G. Schneider, chief engineer. (July 29, p. 206.)

TACOMA EASTERN.—See Chicago, Milwaukee & Puget Sound.

UTAH ROADS (ELECTRIC).—Application has been made in Logan, Utah, for a franchise. Plans made to build from Wellsville, Utah, north to Lewiston, about 20 miles. L. Nielsen, representing Ogden and Salt Lake capitalists and officials of the Logan Rapid Transit Co., are interested.

WILLIAMSVILLE, GREENVILLE & ST. LOUIS.—Train service has been extended on this road from Hiram, Mo., north to Cascade, 11 miles.

Railway Financial News.

ATCHISON, TOPEKA & SANTA FE.—The stockholders will vote on October 27 on ratifying the lease of the Arizona & California, which runs from the Colorado river to Cadiz, Cal., and of the Fullerton & Richfield; purchasing the capital stock of the Fullerton & Richfield, the Concho, San Saba & Llano Valley and the Kings River Railway; also on purchasing the capital stock and bonds of the Gulf & Interstate of Texas and the bonds of the Texas & Gulf.

BALTIMORE & OHIO.—President Willard is quoted as denying the rumor that the dividend rate will be reduced. After mentioning the improvements planned, particularly in train service, he said: "If conditions become such that there is any likelihood of our earnings not being sufficient to maintain the present 6 per cent. rate on the common stock, we will simply suspend all but the most necessary improvements. There are many thousand owners of the common stock of the Baltimore & Ohio, and these people bought it because they thought it would pay them 6 per cent. on its par value, and we are going to do our best to see that they are not disappointed."

BEAUMONT, SOUR RIVER & WESTERN.—The Texas Railway Commission has authorized the registration of $1,855,528 temporary new first mortgage bonds, based on the valuation of the road made by the commission. The issue of $266,566 was canceled and the new bonds substituted.

CENTRAL NEW ENGLAND.—A payment of 5 per cent. on the $7,250,000 general mortgage, 5 per cent., income bonds has been authorized, payable September 30. Last year 4 per cent. was paid.

CUBA RAILROAD.—An improvement and equipment mortgage, covering all railway lines and other property, now or hereafter owned, has been made to the New York Trust Company as trustee, securing an issue of 50-year, 5 per cent. bonds, issuable on account of improvements, additions and extensions at not exceeding $12,000 per road mile. These bonds will be subject to the first mortgage 5 per cent., 50-year bonds of 1902.

FLORIDA EAST COAST.—The directors have authorized the payment of 3½ per cent. on November 1 on the outstanding $20,000,000 general mortgage income 5 per cent., 50-year bonds of 1909.

NATIONAL RAILWAYS OF MEXICO.—This company has bought most of the $10,000,000 stock of the Pan American Railroad, running from Geronimo, on the Tehauntepec Railway, to the Guatemala border, 286 miles, and the entire $1,000,000 capital stock of the Vera Cruz & Isthmus, running from Vera Cruz and Cordova to Santa Lucrecia, 265 miles.

PAN AMERICAN RAILROAD.—See National of Mexico.

VERA CRUZ & ISTHMUS.—See National of Mexico.

WESTERN PACIFIC.—The company has paid out of its own treasury the September coupons on its $50,000,000 first mortgage, 5 per cent. bonds. Heretofore the Denver & Rio Grande has advanced money for the payment of this interest, taking Western Pacific second mortgage bonds as security.

The work on the new line from Arica, near the north end of Chile (formerly belonging to Peru), over the west range of the Andes to La Paz, in Bolivia, encounters serious obstacles. On a large part of the line there has been no rain for 40 years, and 75 miles of pipe line have been laid to secure water while building. From a point 26 miles from the sea, 1,955 ft. above it, the ruling grade is 165 ft. per mile for 17 miles, and there is then a section of cog-wheel track for 25 miles, with a grade of 317 ft. per mile. The summit, 119 miles from Arica, is reached at Laguna Blanca, at an elevation of 15,120 ft. The Bolivia end of the line is over a high plateau and not particularly difficult. The firm of John Jackson, Limited, of London, has contracted to build the road by the spring of 1912. The earth work on some 70 miles on the Bolivia end and 60 on the coast end had been completed last May.

Supply Trade Section.

The plant of the Ottumwa Box Car Loader Co., Ottuma, Iowa, was burned August 30, at a loss of about $100,000.

The Crawford Locomotive & Car Company, Streator, Ill., is entering the field of car building, including freight equipment of all types and steel underframes for passenger or freight cars. The company is also well equipped to handle general repairs, reinforcing and rebuilding of cars.

The Ehret Magnesia Mfg. Company, Philadelphia, Pa., announces that it will on January 1, 1911, commence shipments of Ehret's 85 per cent. magnesia products from its new reinforced concrete plant. This new plant is built upon the site of the buildings which were recently destroyed by fire.

The Davenport Locomotive Works, Davenport, Iowa, had a fire in its plant August 26, which totally destroyed the blacksmith shop and part of the power house. The loss is estimated at $20,000, which is practically covered by insurance. The fire crippled the company for a time, but all shops with the exception of the blacksmith shop are again working full force.

In order to guard against a shut down due to a shortage of natural gas, the Union Switch & Signal Co., Swissvale, Pa., has placed an order with Tate, Jones & Co., Inc., Pittsburgh, Pa., for equipping all its furnaces, forges, etc., with the Kirkwood auxiliary oil-burning system. When this equipment is installed the change from natural gas to oil can be made very quickly.

Charles F. Kenworthy, until recently with the engineering department of the American Brass Co., and formerly of the Kenworthy Engineering Co., has been engaged by the Rockwell Furnace Co., New York, to represent it in the New England states and Canada. Mr. Kenworthy has devoted his entire time, for the past 18 years, to the design and construction of furnaces and fuel apparatus.

Edward H. Barnes, of Atlanta, Ga., has been made a representative, in the Southern district, of S. F. Bowser & Co., Inc., Fort Wayne, Ind., effective September 1. Mr. Barnes has been in the railway supply business for a number of years and was recently associated with the Bass Foundry & Machine Co., of Fort Wayne. While with this company he attended to its railway interests. Previous to his service with the Bass company he was in the operating department of the Southern Railway for a number of years.

L. T. Canfield, who was recently elected vice-president and manager of sales of the Union Draft Gear Company at Chicago, has had considerable experience in railway work and in the railway supply business. From January, 1903, to August of the same year he was with the Standard Railway Equipment Company, St. Louis, Mo., and in 1904 he went with the American Car & Foundry Company, New York, with which concern he was connected until December, 1909, first as assistant superintendent in the steel car department at Berwick, Pa., then as shop director at Manchester, England, and later as shop director at Castellamarre, Italy. He returned to the United States in February, 1907, and since December, 1909, has been in the sales department of the Union Draft Gear Company, at New York.

L. T. Canfield.

TRADE PUBLICATIONS.

Conveying Machinery.—The Link-Belt Company, Philadelphia, Pa., has just issued book No. 81, describing the Peck carrier, its most recent development in conveying machinery for coal, coke, cement and similar products. A large number of illustrations show both details and complete installations.

Bird Neponset Products.—F. W. Bird & Son, East Walpole, Mass., have just issued a large circular, 28 in. x 37½ in., telling of the history, growth and various products of the company. The circular is printed in poster style, in two colors. A smaller circular bears a photographic reproduction of this company's first patent, granted in 1825.

RAILWAY STRUCTURES.

DALLAS, TEX.—The Houston & Texas Central has received bids for the new freight house to be built adjoining the old building on Wood street, between Jefferson and Market streets. The new building will be 200 ft. long, 70 ft. wide, and will cost approximately $40,000. The company expects to have the building ready for service by winter and work will be pushed to that end.

FULTON, ILL.—The Chicago & North Western is building a freight yard and engine terminal point, which is now about half completed. In connection with the yard there will be a 58-stall roundhouse, 80-ft. turntable, modern coaling plant, serving four tracks and having an upper pocket capacity of 800 tons, water station with steel tank of 150,000 gals. capacity, clinker pits with 250 ft. of track, power house, storehouse and hotel and lunch room for employees. All power required to operate the various parts of this plant, such as the turntable, coal hoist, water service pumps, lighting, heating and ventilating fans and shop machinery is to be furnished by two large electric generators located in the power house. The entire steam plant will be in one battery of five 150 h.p. boilers. The approximate cost of the plant is estimated at about $600,000. (Sept. 2, p. 442.)

JERSEY CITY, N. J.—See Hudson & Manhattan under Railway Construction.

MOBILE, ALA.—The Mobile Railway & Terminal Co. has been incorporated in Alabama with $500,000 capital. Terminals are to be established about a mile from Mobile on a large tract of land secured for that purpose, and it is understood that tracks will be built into Mobile. J. T. Cochrane, president of the Alabama, Tennessee & Northern and the Tombigbee Valley railways, Mobile, is president; W. G. Cochrane, vice-president; K. R. Guthrie, secretary and treasurer.

MOUNT VERNON, N. Y.—See New York.

NEWBURG, W. VA.—The Baltimore & Ohio has given a contract to Charles A. Simms & Co., it is said, for constructing a reservoir to have a capacity of several million gallons. The reservoir is to cover more than 15 acres, and will be constructed of steel and concrete. On account of the difficulties experienced by the Baltimore & Ohio at Newburg, W. Va., with its water supply it has been decided to construct the large reservoir at that place.

NEW CASTLE, IND.—The Lake Erie & Western will build a passenger station.

NEW YORK.—A contract has been given by the New York, Westchester & Boston, to William Dickinson & Son, Syracuse, N. Y., for building a reinforced concrete passenger station at Pelham Parkway, in the borough of the Bronx, also for similar structures at Dyre avenue, Mount Vernon, and at East Sixth street, Mount Vernon. The value of the contract is $90,000. (July 15, p. 145.)

WHEATON, ILL.—The Chicago & North Western is asking for bids for a brick passenger station, to cost $10,000.

Late News.

The items in this column were received after the classified departments were closed.

The Pacific & Idaho has ordered one ten-wheel locomotive from the Baldwin Locomotive Works.

The Louisville & Wadley has ordered one ten-wheel locomotive from the Baldwin Locomotive Works.

The American Express now does business over the San Pedro, Los Angeles & Salt Lake, having superseded the Wells-Fargo Express. The American now operates over the Union Pacific, The Oregon Short Line, The Oregon Railroad & Navigation Co. and the San Pedro.

According to a press despatch from Scranton, Pa., Joseph J. Jermyn, president of the Gulf, Texas & Western, has acquired exclusive ownership in the property, including the town sites, coal lines and other subsidiary property. R. C. Megargel, chairman of the board of directors and one of the vice-presidents of the company, has resigned his position, having sold out his interest in the property. This road is now in operation from Jacksboro, Tex., west to Seymour, 75 miles, and it is proposed to extend it northwest to Roswell and southeast toward Dallas.

The Long Island Railroad began running trains into Manhattan, New York City, on Thursday of this week. Previous to the opening, the railway company had run a large number of excursion trains from Long Island towns to Manhattan, each carrying a full load of invited guests; and on the day of the opening, there were celebrations in Jamaica and many other places. On the day before the opening, the Kinsman Block System Co. secured from United States Commissioner Shields a temporary restraining order forbidding the use of automatic stops in the subways and tunnels, on the ground that the apparatus infringes the Kinsman patents. The question of making the injunction permanent will be argued on September 21.

At the freight-rate hearing before the examiner of the Interstate Commerce Commission in New York City on Wednesday, the first testimony presented was from Mr. Brown, general solicitor of the New York Central, in the shape of estimates of the probable increase in receipts if the proposed new rates are adopted. For 50,554 miles of railway in Official Classification territory, the annual increase would be $27,000,000, while the annual increases in wages already granted aggregate $34,700,000. The gross freight receipts of all these roads for the calendar year, 1909, was $725,000,000. These roads serve more than two-thirds of the population of the entire country. After some cross examination, the examiner called upon the Baltimore & Ohio, which had furnished part of the figures, to produce a statement showing what increases in wages had been made by that road in the past ten years.

The Interstate Commerce Commission has found the Pennsylvania Railroad guilty of discrimination in the matter of furnishing coal cars to the Berwind-White Coal Co., to the great injury of Jacoby & Co., of Indiana county, Pa. There were two complaints, and the damages sought to be recovered amount in the first to $51,950, and in the second to $36,901. The commission leaves for future determination the question of damages sustained. On the general question of discrimination it says: "During the years 1902, 1903 and 1904 the employees of the defendant that were in charge of the distribution of coal cars had special orders for giving to the Berwind-White Coal Mining Co. a special allotment of 500 cars daily. That company had contracts for supplying coal for certain steamships sailing from New York harbor. Complaint had been made that these steamers were frequently delayed because of lack of coal, and the defendant felt that it was warranted in making that special arrangement with the coal mines that had undertaken to supply them with fuel. Few, if any, of these specially assigned cars reached the Berwind-White mines in this particular mining district, and therefore, it is difficult to determine to just what extent these complainants were prejudiced by that preference of a competing company's operations in another district. Nevertheless it was inequitable in principle, and undoubtedly so to some extent at least in its results, and we see no grounds upon which it can be justified by the commission."

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Birmingham Southern has ordered five switching locomotives from the American Locomotive Company.

Mitsui & Company, Tokio, Japan, have ordered one Mogul locomotive from the American Locomotive Company. It will weigh 92,000 lbs., and have 17-in. x 24-in. cylinders and 54-in. driving wheels.

The Castel Valley Railroad has ordered one freight, 2-8-0, locomotive from the American Locomotive Company. This locomotive will weigh 156,000 lbs., will have 20-in. x 26-in. cylinders and 50-in. driving wheels.

The Tremont Lumber Company, Winfield, La., has ordered one logging, 2-6-2, locomotives from the American Locomotive Company. This locomotive will weigh 101,000 lbs., will have 16-in. x 24-in. cylinders, and 46-in. driving wheels.

CAR BUILDING.

The Baltimore & Ohio is asking for equipment specifications for 75 steel passenger coaches.

The Chicago, Milwaukee & Puget Sound has confirmed the report of the *Railway Age Gazette* of September 2 to the effect that it will build 250 logging cars at the Tacoma shops.

The El Paso & South Western, reported in the *Railway Age Gazette* of September 2, in an unconfirmed item, as being in the market for passenger cars, advises that it is asking prices on three baggage, two postal, two chair and four steel coaches.

The Lehigh Valley is asking for equipment specifications for 1,000 hopper cars. These cars are understood to be the remaining 1,000 of the inquiry for 3,000 cars reported in the *Railway Age Gazette* of September 17. The 1,000 gondolas were reported placed on October 8 and the 1,000 box cars on October 22.

The New Orleans, Mobile & Chicago, as reported in the *Railway Age Gazette* of August 19, has ordered 200 forty-ton flat cars and 100 forty-ton box cars from the American Car & Foundry Co. The flat cars will be 41 ft. 6 in. long, 9 ft. wide and 4 ft. 1¼ in. high. The underframes will be of steel. The inside measurements, and 41 ft. 11 in. long, 9 ft. ⅝ in. wide, 14 ft. 10½ in. high. The bodies will be of wood and the underbox cars will be 40 ft. long, 8 ft. 6 in. wide, 7 ft. 10 in. high, frames of steel. The following special equipment will be used:

Bolsters, body	Built-up
Bolsters, truck	Arch bar
Brakes	Westinghouse
Brake-beams	Buffalo Brake-Beam Co.
Brake-shoes	Cast iron
Couplers	Sharon
Draft gear	Farlow Draft Gear Co.
Dust guards	Wood
Wheels	33-in. cast iron

The box cars will have inside metal roofs.

MACHINERY AND TOOLS.

The Chicago & North-Western will purchase some electrical machinery for its new engine terminal at Fulton, Ill. (See under Railway Structures.)

IRON AND STEEL.

The Northern Pacific has ordered 385 tons of structural steel from the American Bridge Co.

The Korean Railway has ordered 7,000 tons of rails from the United States Steel Products Co.

The Chicago, Milwaukee & St. Paul has ordered 9,000 tons of rails from the Lackawanna Steel Co.

The Oregon Short Line has ordered 5,500 tons of structural steel from the Pennsylvania Steel Co.

The Copper Range Railway has ordered 160 tons of structural steel from Worden-Allen Co., Milwaukee, Wis.

The Louisville & Nashville has ordered 500 tons of structural steel from the Louisville Bridge & Iron Co., Louisville, Ky.

The Missouri Pacific has ordered 800 tons of structural steel from the Virginia Bridge Co., Memphis, Tenn., for a bridge at Judsonia, Ark.

General Conditions in Steel.—The month of September, so far, has not shown any heavy buying movement as has been generally anticipated, although manufacturers look for considerable improvement later on. Reports indicate that the increase in new buying, as compared with the first week of August, does not exceed 5 per cent. Small orders for immediate use predominate with very few, if any, large and long time orders.

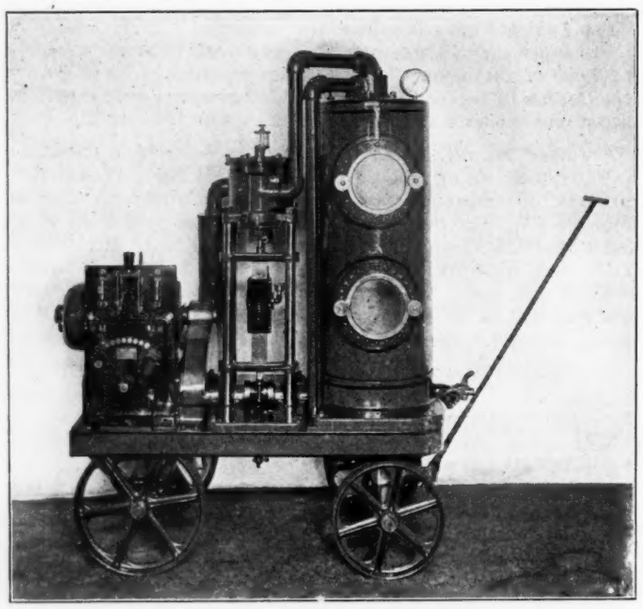
Keller A. O. Portable Vacuum Cleaner.

The portable vacuum cleaner illustrated herewith is made by the Keller Manufacturing Co., Philadelphia, Pa. It is for use in hotels, auditoriums, office buildings, railway yards, etc. This size has sufficient capacity to operate one 10-in. sweeper; two 4-in. upholstery renovators; one 4-in. round brush, or two 10-in. rectangular wall brushes.

Its small size and light weight provide for its being easily portable. The over-all dimensions are 22 in. wide, 46 in. long and 56 in. high.

The motor, pump and separating tanks for collecting the dust are mounted on a substantial truck, having wide faced iron wheels and forged steel axles. The wheels may be rubber tired for indoor use. The main frame work of the truck is built of heavy angle iron, securely riveted at the corners and reinforced with gusset plates. The fifth wheel is large, all parts being made of forgings or steel castings.

The motor shown, 1½-h.p., is of a semi-enclosed type, but it may be fully enclosed for use out of doors. This motor is



Keller Portable Vacuum Cleaner.

furnished for any standard current and voltage and is of ample power, so that at no time is it worked over load. Ring oilers give automatic lubrication to the armature shaft. For direct current, a suitable starting box and main line switch are mounted near the motor in a metal box.

The Keller vertical, double-acting, piston-type, vacuum pump used with this equipment has a cylinder 7 in. in diameter by 4-in. stroke. The cylinders and valve chambers are cast in one piece and of such thickness as to permit one reboring. The piston, of the hollow type, has metallic packing rings, and the crosshead guide is of the marine type. The piston rod, connecting rod and crank shaft are of forged steel. The periphery of the heavy counterbalanced fly wheel is provided with cut teeth, which mesh into a cut rawhide pinion on the motor shaft.

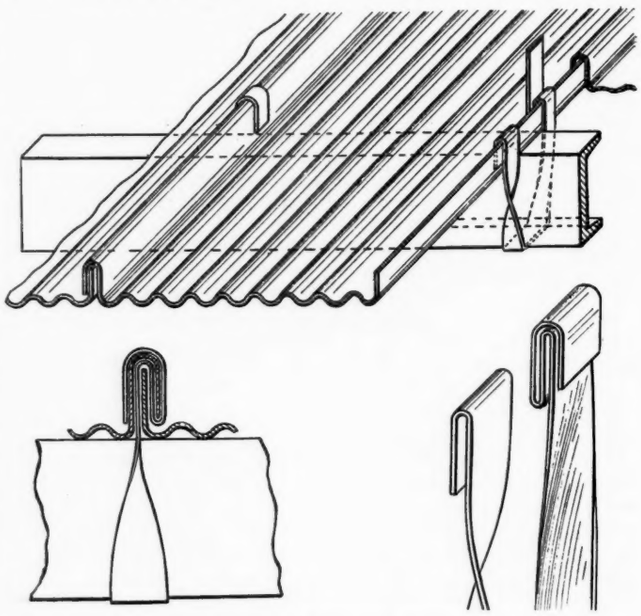
The two superimposed tanks (shown in the photograph as one tank) collect and separate the dust which is pumped into them, and afford sufficient storage capacity to avoid frequent emptying. The incoming dust-laden air enters at the side of the lower tank, is projected upward against the inside of a conical baffle device, and the heavy dirt and large particles of dust are drawn down by the force of gravity. These tanks are made of sheet metal, securely welded, without rivets and thoroughly galvanized. They are tested to a pressure above that to which they are subjected in use.

The displacement of this machine is 45 cu. ft. of free air per minute. The working vacuum is 10 to 15 in. of mercury, but the pump will produce a maximum vacuum of 20 to 22 in.

New Corrugated Iron Roof.

The Edwards Manufacturing Co., Cincinnati, Ohio, makers of a complete line of sheet metal building material, such as cornices, skylights, metal ceilings, etc., has just perfected a new corrugated sheet steel roofing which is said to be different from anything previously offered in this line.

There is perhaps no more popular roofing than corrugated steel. However, regular corrugated roofing, as manufactured



Details of Edwards Roof.

to-day, is said to have a number of disadvantages. The Edwards patent pressed standing seam corrugated roofing is understood to do away with many of these objectionable features. It is especially adapted for use in structural steel buildings, to which the corrugated steel is applied afterwards, either as a siding or roofing. The accompanying drawings illustrate this feature and the method of its application. The roof has tight seams and is applied directly to the purlins without the use of rivets, which are largely responsible for the corrosion when they are used.

In order to get good results with corrugated iron it is necessary to lap the sheets over two corrugations. By using this new roofing, with the standing seam, a great saving can be effected on the side seams alone, and in addition, a much tighter side lock is assured. By means of the cleats used with this roofing, it is possible to make tight joints, and at the same time to provide for vibration. This roofing can be placed and worked entirely from above, no scaffolding being necessary, which is a very important consideration when it is difficult to arrange scaffolding on the under side of the roof.

Sweden is preparing to operate a railway in Lapland by electricity to connect with its line from Gellivard to the Norwegian port of Narvik, which now carries great quantities of iron ore. The Lapland line is expected to carry some 4,000,000 tons of ore yearly. The water supply is said to be abundant. It will be conducted to the turbines and flow from them through tunnels, and the engine room is to be blasted out of the solid rock, where the Arctic weather will have comparatively little effect.